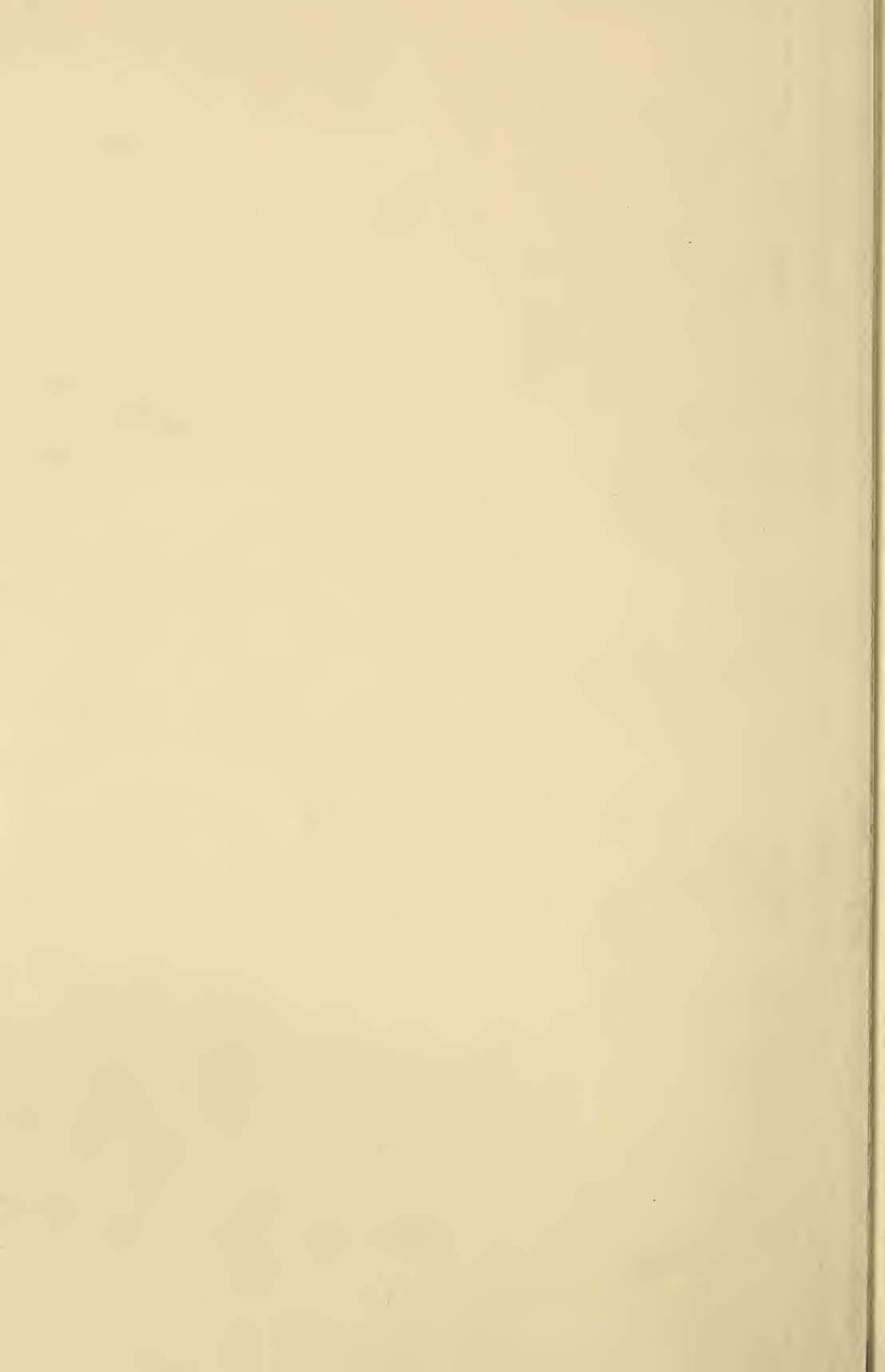


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A JOURNAL
 DEVOTED
 TO BEES
 AND HONEY
 AND HOME
 INTERESTS.

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No. 9.

FROM DR. C. C. MILLER.

BEGINNERS should remember that a queen is found more easily on a fine day when many bees are afield. Fewer bees are in the way early in the season.

FEEDING outside by wholesale is done by filling combs with thin syrup, then putting them widely spaced in hives piled up where bees have full sweep.—R. C. Aiken, in *American Bee Journal*.

SWEET CLOVER is always having some new item to its credit. This time it's J. McArthur, in *American Bee Journal*, who credits it with the protection of insectivorous birds where the forests have been cleared off.

M. SEVALLÉ, editor of *L'Apiculteur*, reports the case of a person subject to frequent attacks of nettle rash being radically cured on receiving the first bee-sting. But he suffered so from stings that he had to keep away from bees.

AMALGAMATION seems to be opposed mainly or wholly on mistaken grounds. The latest is from a writer in *American Bee Journal* who seems to think amalgamation means to "tack on to members who do not wish it, the expense of expensive meetings." Who ever dreamed of such a thing?

"I FIRMLY BELIEVE," says Observer, in *Progressive*, "that A. I. Root has induced more people to embark in bee-keeping than all other persons or agencies combined." That's not meant for a compliment, A. I., for he thinks Skylark is not far wrong in saying that every new bee-keeper lowers the price of honey.

UNFINISHED SECTIONS are destroyed by some. Others value them highly. Hutchinson says, in *American Bee Journal*, "I have seen seasons in which I was well satisfied that a case of partly drawn sections of comb to give a colony at first meant just one more case of finished honey." So he likes to have a lot of unfinished sections.

ANSWERING that question on p. 312, I should say very decidedly, print the names of those who refuse to pay what every reasonable man would be glad to pay, because the outlay was made for his benefit, and without its payment he would have had more to pay. There's been too much hushing up.

PROF. COOK reports in *American Bee Journal* that A. D. D. Wood has gone to California and expects to locate on Catalina Island two isolated apiaries where he hopes to secure pure mating of Italian and Carniolan queens. Prof. Cook thinks the mild climate makes the project more hopeful than D. A. Jones' experiment in Georgian Bay.

PLEASE CONVEY to Bro. Taylor my thanks for his commiseration, and my regret that he neglected to accompany it with an invitation to come to his house to eat fish with him when he had a good stock on hand. It might be a good thing for him and me and a certain editor to get together and have a fish-feast. [That editor stands ready to accept.—ED.]

SOME THINK that the increase of the circulation of bee-journals is a damage to the business by increasing the number of bee-keepers. I wonder if these good people stopped to think that a man doesn't subscribe for a bee-journal until *after* he commences keeping bees. It's the ignorant bee-keeper who does most harm to the business, and every new subscriber means the exchange of an ignorant man for one better informed.

ADULTERATION of honey riles S. E. Miller, who thus delivers himself in *Progressive*: "I am not now engaged in the production of honey, but would gladly pay \$2 per year to the Bee-keepers' Union if it would hunt down these scoundrels and give them their just dues." [Yes, there are a good many more who would pay their \$2, and more, if the Union would only take a more active interest in this matter of adulteration.—ED.]

A NEW IDEA. C. Theilmann thinks that not only should hives be unpainted, but that the outside should be unplanned. The outside roughness prevents warping and cracking, and

the bad effects of the sun in hot weather.—*American Bee Journal*. [I'll venture to say that there is not one of our customers in a thousand who would accept unplanned hives if we were to try to push them on to them by saying they were better.—Ed.]

BRO. DOOLITTLE, referring to your question on p. 303, I've always supposed that the words "prime" and "second" referred to time rather than quality or conditions. The rule is, that the old queen goes with the first swarm; and it's such an unusual thing for it to be accompanied by a virgin queen that perhaps it ought not to be called a prime or first swarm. Still, there seems a certain incongruity in calling the first swarm that issues a second swarm. I wish there were a special name for it.

CRIMSON CLOVER. Galen Wilson, in *Country Gentleman*, reports a piece sowed July 20, latitude $42\frac{1}{2}$ in New York. "All winter long there has been a succession of light snows, thaws, and heavy freezes. The thermometer has been down to 12° below, and about that point several times. Surely, if any winter would kill it here it was expected this one would; but now when the first third of March has gone, there the clover stands, smiling in its verdure." [Our field of crimson is now the finest field of green of any thing to be seen around here. It wintered well.—Ed.]

F. L. THOMPSON is getting balky; won't peddle honey. Well, Bro. T., that's about the way I've felt about it, but I didn't dare say so. It isn't pride. I'll tie a red bandana handkerchief around my head, and wheel dirt on a wheelbarrow on the street, to pay the man who has the gift to peddle honey; but I haven't the peddling gift; and, standing in the shadow of F. L. T., I too will say I won't. [To be frank, I stand with you two. But people are not all made like us; and the articles that I have solicited along these lines have been for the benefit of those who can peddle.—Ed.]

STOP MY PAPER! I'm misrepresented on page 306. Say, Ernest, look at page 199, *American Bee Journal*, again, with your glasses on straight, and see if I rather advise getting bees by the pound. I didn't advise getting bees of a farmer, for you will see the question precludes that he "must" buy of some dealer. I said, "If the bees are to be got a long distance, so that the expressage is a very serious matter, then it may be quite a saving to get the bees by the pound." But in ordinary cases I would not advise getting by the pound. Yes, I see by your catalog you've "discontinued the pound business entirely," but by the same token you've discontinued colonies and nuclei. Shall I tell the fellow to begin with nothing but a queen? Stop my paper! [What I was quarreling with you about particularly was advising to get bees by the pound *at all*, of any one,

when they couldn't be bought that way without combs. We have, it is true, given up selling nuclei and colonies; but we gave up the pound business long before.—Ed.]



PAINTED VS. UNPAINTED HIVES.



When I attempt to hunt the lion to his lair, or beard him in his den, I always go completely armed and approach him with cautious and wary steps. On page 51, *American Bee keeper*, G. M. Doolittle advises that single-walled hives be used unpainted, and gives the following reasons:

But I think I hear some one asking, "Wherein is an unpainted hive better than a painted one?" Principally in this: that, if properly covered, it will keep the bees dryer at all seasons of the year; and, owing to this dryness, they are consequently much warmer. As unpainted wood is porous, the moisture evaporates or passes through all parts of the hive, keeping the bees dry, warm, and quiet, avoiding any undue consumption of honey, as well as disease.

Now, I don't intend to kick hard against this, because it is not written for this climate; but I think the writer is wrong when he assumes that "the moisture from the bees passes through the pores of the wood and out of all parts of the hive." The fact is, the moisture is merely absorbed *into* the pores of the wood. If friend Doolittle will take a hammer and strike a sharp blow on the inside of one of these "dry" hives he will find that the water will fly from under the face of the hammer. In time the sun will draw this moisture through and out of the wood, but not in time to do the bees any good. Unpainted hives are a "delusion and a snare." They warp and twist and split in all directions. They may stand upright, and behave themselves like good and true American citizens, in Borodino, N. Y.; but they do not do it in this climate, or "this locality." Take a full-grown hive, with two supers or top boxes cut to fit it exactly; paint the hive, but leave the supers unpainted, and in one year the supers will not go on the hive at all. They will also be warped and twisted out of shape, and the wood broken, and falling away from the nail-heads. It is hard to tell whether it belongs to the present century, or is the wrecked hopes of a bee-keeper a thousand years ago. On the contrary, a well-painted hive—kept painted—will last a hundred years. I have not had any in use quite that length of time, but intend to test the matter as long as I can, even if I have to keep them two hundred

years. This court, therefore, gives judgment against the plaintiff, but assures him of its most enduring friendship—after he has paid the costs.

Rambler has informed me that he intends to make a visit to this part of the country soon. What a meeting! *Skylark* and *Rambler*! Now, don't you fellows be jealous—don't tear your hair and wring your hands with envy and despair. We shall meet, whatever your agony may be. *Skylark* and *Rambler*! Well, well; we can't *all* be great men. The only advice I can give you is to settle back into your sphere and be contented with your lot. *Skylark* and *Rambler*! O *Jehoshaphat*! what a meeting will be there!

The California Bee-keepers' Exchange is a fixed fact—fully organized, and open for business. I think there was one great mistake made, and one or two smaller ones, which may be rectified before long. The great mistake was in restricting the membership to California bee-keepers. It should have been left open to any and all bee-keepers in the United States. This would really have made it a national affair at once. The eastern bee-keepers would have seen, without any undeveloped intellect at all, that what is our interest is theirs, and would have piled into the Exchange, without any compunctions of conscience or stay of execution. Why should not Dr. Miller, with his immense crops, be admitted on equal terms with *Skylark*? The Exchange will sell Dr. Miller's comb honey for 2½ per cent, the same rate it charges members. Now here a question stares me in the face—what benefit accrues to a comb-honey producer to induce him to become a member of the Exchange? If he can get his business done just as cheaply and securely without becoming a member, why spend the four dollars for admission and dues? The remedy is plain. Open up the Exchange to all the fraternity in the United States; charge outsiders just double the rate charged members. Even that, with only the actual and honest bill of expenses, is far better than any one can do with commission men. This would be a bait to the bee-keepers. It would be like throwing out a large piece of comb honey in a dry time to the bees. Oh how they would swarm into the Exchange!

WATER IN SUGAR SYRUP.

MARKETING HONEY; ADULTERATION; AMALGAMATION: THE PROGRESS OF APICULTURE COMPARED WITH OTHER AGRICULTURAL INDUSTRIES.

By P. H. Elwood.

Skylark, in a late number of *GLEANINGS*, laments the dense ignorance of bee-keepers; and, having the Rocky Mountains and his pseudonym to shield him, proceeds to hold up

water to put with sugar for winter feeding. I do not object to sitting upon the dunce-block; but when *Skylark* refuses me the company of teamsters, stockmen, and poultry-keepers because they are so much better informed than bee-keepers I do object. The alleged superiority may exist in California, but is not acknowledged here where bee-keepers are recognized as intelligent as other agricultural classes. The assertion, that the classes mentioned agree, and are better posted than we on the feeding and care of their stock, is not true. One teamster will feed his horses nothing but oats; another, corn and oats; still another, corn and bran. One will have his grain all ground, another not. One will cut his coarse fodder, moisten it, and mix in the meal; another is opposed. One will feed and water his horses while warm; another is sure to founder his teams by so doing. One will give his horses all the water they will drink, and water frequently; another will water only at meal time, and then but a pailful, be the pail large or small, the weather hot or cold, the labor excessive or little. The same diversity exists in blanketing, in clipping, and in driving. The differences and egotistical pronunciations of bee-keepers to which *Skylark* refers certainly do not surpass those of good horsemen.

Pretty much the same difference in feeding and care is noticed among good dairymen. In late numbers of that excellent journal, *The Rural New-Yorker*, I noticed a series of able articles entitled "Feeding a Hen." From these articles, and from other sources, I learn there is quite as much variation among successful poultrymen as to the feeding and care of their flocks as exists among bee-keepers. If you were to ask the professors of gallina culture how much feed it costs to produce a pound of feathers, the answers (if they dared to attempt answering) would vary more widely than do ours as to the number of pounds of honey consumed in producing a pound of wax. And our answers as to the comparative cost of comb and extracted honey, quite likely, would bear comparison with theirs as to the comparative cost of a pound of eggs and a pound of flesh.

The history of apiculture is a record we need not be ashamed of. "Langstroth on the Honey-bee," written more than a third of a century ago, was the ablest and the best written handbook that had appeared upon any rural pursuit, and there are very few works at the present time that will bear comparison with it. The first volume of the *American Bee Journal* occupies nearly the same position among rural journals. The invention of the honey extractor antedated by nearly a score of years the invention of the centrifugal cream-extractor; and but for the former, the latter might never have been thought of. Comb foundation, zinc excluders, the bee-escape, smokers, etc., bear fa-

myself and Dr. Miller as examples because we do not happen to agree upon the amount of favorable comparison with agricultural inventions. The discovery of parthenogenesis, by the blind Huber, followed since by the unraveling of so many of the scientific mysteries of the beehive, makes a record not surpassed in any branch of husbandry. In literature, in invention, in discovery, or even in practical results, we do not fear comparison with any branch of agriculture. There is no need of belittling the pursuit because a few of us are not well posted.

THICK OR THIN SUGAR SYRUP.

Dr. Miller prefers to feed a thin syrup, such as can be made by the cold processes mentioned in the query. I prefer to feed a thick syrup with acid, such as can not be made without heat. My answer, of course, was based on the quantity of water in the syrup, while I infer that Dr. Miller's was based on both the syrup and the cold method of making the same. I prefer to feed a thick syrup, because it saves the bees much labor in evaporating, and also that I may be sure they will not suffer, if, from any cause, they fail to properly evaporate a thin syrup. When a thin syrup is fed late in the season (the time when feeding is done by a majority of bee-keepers) it is not properly ripened. When fed early it is usually well ripened, but always at a heavy cost in the vitality of the bees. The life of a worker bee is not measured by time, but by the work it performs; and it is not too much to say that a full quarter of the vitality of a swarm of bees is often consumed in storing a winter supply of sugar syrup. Even when done under the most favorable condition, the loss is so heavy that it is safe to say that the feeding of sugar syrup in the fall is at the best a necessary evil, and to be avoided whenever possible. The bees become aged by this period of activity, and, although they may winter well, in the spring are unable to rear brood as rapidly as colonies depending upon natural stores. The lack of brood in sugar-fed swarms has often been observed, and always explained by the supposed inferiority of the food; whereas the cause is only partially this. That close observer, Capt. Hetherington, first called my attention to the great loss of vitality connected with feeding. Cheshire also admits the same, and gives a partial explanation based on physiology.

NATURAL STORES PREFERRED.

For several years I have kept a record of sugar-fed colonies, and I have been slowly forced to the conclusion that, under present conditions, natural stores are the best. Occasionally, when honey is of poor quality, sugar stores are the safest; but such years have lately been the rare exception, and our best results, on the average, come from hives heavy with natural stores in the fall. With small brood-

chambers a larger proportion of the honey will be stored for market; but where will be the gain if sugar has to be returned for winter? Even if we grant that it can be fed so early as to promote a sufficient brood-rearing to maintain the normal strength of the colony, the extra amount consumed will more than counterbalance the difference in price per pound. The hundreds of tons of honey thus yearly thrown upon the market by the exchange of sugar for honey must make some difference in present prices—quite likely more than any of us surmise.

I think it both unsafe and not wise to advocate filling up all unoccupied space in the brood-chamber, just previous to the honey-flow, with sugar syrup. The aim should be to get the brood-nest as nearly as possible filled with brood, which is very much more favorable for surplus storage than thick sealed combs. But admitting that it is a good thing to fill up the combs, why not feed honey, and help some poor producer of extracted honey instead of the sugar trust? It is conceded that sugar-syrup stores will cost, properly ripened, 4 cents per pound; but the cost will be more nearly the price of the bare sugar, or $5\frac{1}{2}$ cts. Honey is now quoted as low as $4\frac{1}{2}$ cts. per pound in several of the large markets; and in Cincinnati, Albany, and San Francisco, as low as 4 cts. It can be bought of producers as cheaply. Boil it to prevent infection; add your water, and feed. This, of course, is dark honey, but just as good for winter, and we think we have more uniformly good than light honey. Its being dark will, therefore, make no difference whatever, as the advocates of this method say that, in no case, will any of it be stored above. Should any of it show in sections it will prove that it is not safe to use sugar in this way. Having had thousands of pounds of honey carried above, both before and after the basswood flow, and having had, in full-size brood-chambers and in full-depth frames, wide margins of sealed honey carried above after basswood, I need not predict the result of cramming the hives with dark honey.

THE EXCHANGE IN CALIFORNIA.

I am glad to see the Exchange started in California. It will help us, if they succeed in maintaining living prices. Overstocking the principal markets, combined with the adulteration of their extracted honey, whereby the number of pounds is more than doubled, has brought down prices rapidly. With guaranteed purity, suitable packages and proper distribution, California honey could all be marketed west of the Rocky Mountains, at good prices. I mention this section because it is near at hand, and free from competition from honey outside of the Exchange. As soon as the Exchange begins operations in the East, a strong effort will undoubtedly be made by un-

principled dealers to break it up by selling at low prices honey obtained on commission from bee-keepers here. It will take some years yet before the majority of Eastern bee-keepers are ready to join a similar or the same organization. They have not yet graduated from "brush college." There is no doubt that adulteration, and the well-grounded fear of the same, has lessened the consumption of honey, and at the same time lowered the prices more than all other causes combined. The only way to stop it is, as the editor of *GLEANINGS* says, to fight it and not attempt to hush it up, as I fear some of our California friends have lately been guilty of doing. Silence just suits the mixers of the vile stuff, for they are continually crying, "Let us alone," as did their ancestors who went down to the sea in a herd of swine. The farmers of this country went into the fight against oleomargarine and its allied compounds, and have won a great victory. This is being repeated with filled cheese, and must be with glucose adulteration. The idea advanced, that we stop adulteration by stopping the production of extracted honey, and produce comb honey instead, is a cowardly surrender to the enemy. Comb honey, can never take the place of liquid honey for warm cakes and for other purposes. In my home market I sell ten times as much extracted honey as of comb, and this locality is the counterpart of many others. If my patrons could obtain no extracted honey my sales of comb would increase but little.

INACTION OF THE UNION ON THE MATTER OF ADULTERATION.

It is a pity that the Bee-keepers' Union, while under the efficient management of Thos. G. Newman, could not have taken up the matter of adulteration. Undoubtedly it would have done so had the bee-keepers of this country thrown all of their energies into one organization instead of dividing them between two. It will require a united front and some money to stop this business. At a time when the Union so much needs the cordial support of every intelligent bee-keeper of the United States, it seems unwise to refuse the admission of the North American, for this is really what this society is asking of us. The constitution advised by the amalgamation committee differs but slightly from the present constitution; and I can not see that it will impair the usefulness of the Union, while it will bring to us a large and valuable support. The management remains the same, vested in a board of directors selected by the votes of all of the members of the Union, as at present. The popular annual meeting, if such is held, has no control over the funds of the Union—neither directs its policy nor elects any of its officers. I can understand why the Canadians oppose the amalgamation, as they probably foresee that it will be found impractical to make the new Union international. For several years the usefulness of the

North American has been seriously impaired, and its existence imperiled, if not shortened, by a long-continued quarrel between the Americans and the Canadians. I suggest that the present time would be a favorable opportunity to end this belligerency by each party consenting to mind its own business. By making the Union a national organization we shall be at liberty to attend to the question of adulteration of our products, and the enactment of such laws as may be necessary to wipe it out; and if, at any future time, the board of directors conclude that the Union can assist in any way in marketing honey, there will be opportunity to do so. It may be found practical to disseminate information as to the relative needs of different markets and different parts of the country for shipments of honey. Our weekly *American Bee Journal* is published at the present headquarters of the Union, and information as to the weekly receipts and further needs of the chief distributing-points could be quickly disseminated. In some such way an intelligent oversight of the markets might be had, of much service to honey-producers, with no investments, and at not a heavy expense. It would not do to use Canadian money for this purpose, nor would it be advisable for us to try to assist them in a work that they could do so much better themselves.

But more important than any exchange or possible supervision is the thorough development of a home market by every bee-keeper. The bee-keepers of this part of the country could easily sell all they produce in their home markets when such amount does not exceed a ton, and is put up in such form as to suit the demand of consumers. This would reduce the amount sent to the cities or main distributing-points, so that prices would materially improve.

Starkville, N. Y.

[This I regard as one of the most valuable and suggestive articles that we have ever published; and while Mr. Elwood's views on the subject of feeding may not harmonize entirely with my own, or perhaps with those of Mr. Boardman and others, I shall not be so foolish as to declare that he is wrong. I was associated with Mr. Elwood one time for nearly a week at his home, and met Capt. Hetherington at one of the Albany conventions. My acquaintance with both led me to believe that they are among the most careful thinking men in our whole industry; at all events, I venture to say that there is not another pair in the world who own and manage so many colonies. We may give their opinion of the matter due consideration.

But 't is well known that bees can be reared very cheaply by feeding; and is it not possible that waste occasioned by extra energy on the part of the bees during spring and early summer feeding, on the plan laid down by Mr. Boardman, will be more than overbalanced by the extra amount of brood, young bees, and early honey?

Yesterday I talked with Mr. M. G. Chase and U. Prince, prominent bee-keepers of this county, and told them briefly Mr. Elwood's point—

the waste of bee life consequent upon feeding. Mr. Chase admitted that it might be true; "but," said he, "I tried it last season, and I was satisfied that it paid me—waste or no waste of energy."

In discussing this problem we need to consider that bees are comparatively cheap now, and can be reared cheaply. If we sacrifice half a colony of old bees, or even a whole one, and yet secure in return a good big rousing swarm in its place, and a yield of honey besides, is not the trade a good one? Understand, I do not say such a trade can be made; but I say, *if* it can be made.

There may be something in Mr. Elwood's point, that the large use of sugar syrup might make some difference in the present prices of honey. Well, then, if honey can be bought cheaply, Mr. Boardman's plan will work just as well with honey as with syrup. Then if some of the product does get into the super it will do no harm, because it *is* honey; but the dark stuff would not improve the appearance of the nice clover and basswood section honey. As Mr. Boardman manages, however, I do not believe that sugar syrup will go above, for I believe he recognizes that there are conditions when it may do so, and is careful to avoid those conditions.

In regard to the amalgamation matter, the editorial in another column was written before Mr. Elwood's article came; and I am pleased to note that it is in harmony with what he has to say.—Ed.]

DOES INVERTING DESTROY QUEEN CELLS?

FOOTNOTES IN AND OUT OF PLACE; DR. MILLER'S COUNT ON THE T-SUPER VOTES.

By Dr. C. C. Miller.

I send herewith a letter that explains itself.

Dear Dr. Miller:—I am, I suppose, having the usual interesting and varied experience common to novices in bee-keeping. I just read all I can get hold of, and consequently get a little too far ahead, and befogged. I should like to know how you understand the following extract from GLEANINGS, June 1, 1895, page 451:

"This plan of getting the swarming-date of a number of colonies on the same day, so dispensing with a watcher, is one I have carefully followed in my out-apiary for three seasons past. But I give them now but nine days between visits; and when there, instead of destroying cells one by one, I turn each of the brood-cases upside down, which *effectively and positively destroys all embryo queens*, and none can escape, and the colony is safe for nine days. This colony is swarmed on next visit; also all others like it previously inverted. The other colonies are *inverted if strong, or likely to swarm; and if they have cells sealed next visit, they are swarmed in their turn*; but if they have young cells, or none at all, they are inverted again and are safe till next visit, and so on with all hives as they advance to swarming-strength every nine days for the two or three months of our swarming season, etc. T. BOLTON."

"Dunkeld, Victoria, Aus."

Well, doctor, this is something new to me, entirely, and I have failed to find any comment on this plan in any papers or books I have read. Does inverting the hive kill all embryo queens as he says? and, further, how does he swarm them on his next visit? The next few lines appear contradictory—"if they have cells sealed next visit, they are swarmed in their turn;" perhaps you with your ripened experience can lift the fog somehow. Can they have sealed cells if inverting destroys all embryo queens?

I have now 14 colonies. I began with a few swarms last spring, and harvested some 500 lbs. of nice comb honey from 10 colonies, the best part of which was gathered in the fall. I hived a swarm on the 19th, which took me a little by surprise. There was a full gallon of bees in that swarm. I looked

all through the other hives, but could find no intention of swarming as yet in the shape of queen-cells, although the hives are boiling over with bees, and full of sealed brood. There were five capped queen-cells, and one uncapped, in the hive from which the swarm issued. The bees are bringing in honey fast from fruit bloom, and commencing to draw the foundation in the supers. I often think of the hardships of having to winter bees in cellars east of the Rockies, and doubt whether I should keep many bees under such conditions.

Merced, Cal., March 20.

A. R. GUN.

Now, Mr. Editor, the foregoing letter shows the need of that sometimes praised and sometimes abused thing, the footnote. On page 451 of GLEANINGS for 1895, the unqualified statement is made that turning the brood-cases upside down "effectually and positively destroys all embryo queens, and none can escape, and the colony is safe for nine days." The novice reads that with a glow of enthusiasm. "There's the very thing I've been wanting—so simple and easy! Just turn all the brood-combs upside down once in nine days, and the work is done. Why has no one told me that before?" Then our novice goes to his hives at the beginning of the honey harvest, inverts them, leaves them nine days, then inverts every nine days again, but is saddened to find nearly every colony swarming. Here's what you ought to have done, Mr. Editor: you ought to have taken out your little pencil, and written something like this: "At one time there was a good deal said about queen cells being destroyed when combs were inverted, that being one of the strong points in favor of inversion; but so many failures occurred that the matter fell out of use, and latterly little or nothing has been said about it. The novice will do well not to put much dependence on the plan until he has first tried it on a small scale." That's what you ought to have written, Mr. Editor, and then you ought to have tucked that note on to the bottom of the letter on page 451. That's the place for it, and not several pages away.

When you send GLEANINGS to our good friend at Lapeer, gather up all you have to say on one page. That's the way he likes to have it. But in the copy that you send to Marengo, please say what you have to say about any thing that is published in GLEANINGS right at the time I'm reading it and not the next day. I don't want to be bothered hunting up afterward, perhaps having to read it all over again; but I like to know what you think about it right while it's fresh in my mind. And don't you mind what Bro. Taylor says about writing on the "spur of the moment," "without thought." He's a good man, and means well; but when he wrote what he did in *Review* about footnotes he wrote on the "spur of the moment," and "without thought." It may be all right to write on the spur of the moment. We often need spurs, and sometimes it's just as well to write while the prick of the spur is felt. But it isn't right to write without thought—neither for an editor nor for an experimenter. And,

clearly, Bro. Taylor wrote without thought when he associated with footnotes the idea that necessarily they would have less thought or care when attached to an article than when put on a different page. I don't need to elaborate the idea—he'll admit it just as soon as he gives it thought. You just keep on making editorial comments; we all like to read them, but by all means put them where they connect most closely with what you're talking about.

Returning to what Mr. Bolton said on page 451, I don't really suppose he meant to say that, if a colony was inverted once in nine days, there would be no possibility of swarming. But that was probably understood by a good many. I'm not sure that I can clearly answer the questions of my California correspondent. I don't know just what Mr. Bolton means by an "embryo queen." If he means up to the time the young queen emerges from the cell, then his statement quoted can hardly mean any thing less than that inverting every nine days is all that's necessary without ever looking into a hive. But if he calls them embryo up to the time they are sealed, then he may mean that only unsealed cells are destroyed by inversion. Nine days is long enough time for fresh cells to be started and advanced to sealing; and if he finds cells sealed he "swarms them," which perhaps means that he makes an artificial swarm by taking away bees and brood.

If inversion would destroy all unsealed cells, then inversion every seven days would prevent all swarming, and that would be a big thing; but nearly all have, I think, given up the plan as a failure.

THOSE FIGURES.

I said Hon. R. L. Taylor was a good man. So he is; but he isn't always good. Sometimes he's bad. He was bad when on page 226 he tried to shake my confidence in myself as a mathematician. I don't know as much as I might, but I always did think I could count. Even the solace of that thought Bro. Taylor wants to wrench from me.

I've just taken off my coat, and counted it all over again. I come out of the effort a sadder (but I'm sorry to say not a wiser) man. I'm not nearly so wise as I thought I was. The one thing that I thought I certainly knew, I find I don't know; for I don't know how to count. The director of the experiment station and the editor of *GLEANINGS* agree on the count on page 111, *American Bee Journal*, so there can be no mistake about the correct count. I can't count it the same way, so there's no alternative—I can't count.

More than that, it seems I can't use the correct English expression. For I said T supers had a majority of votes when I didn't mean they had a majority of all votes, but a plurality. I suppose I might get out of that by saying they had a majority over any other one kind.

Certainly I didn't make such bad work counting as to think that T supers had more than half of all the votes cast.

Now, Mr. Editor, I think I've been humiliated sufficiently to be teachable, and am ready to sit at your feet and learn how to count. I'd rather learn from you than from that man Taylor. It is true, you help him to expose my ignorance, but you wouldn't have done so if he hadn't begun it. So I'm maddest at him. You say six prefer T supers. I'm glad of that, for that's just what I counted. So I can count some things. "Six out of 22," you say. I don't know whether I can count that 22 straight or not. I can count 22 people, but hardly more than 17 votes, for five of the people don't tell whether they like T supers or some other surplus-arrangement best, the answer of one being "One-pound sections." But never mind about that—teach me to count a smaller number first. I count 4 for slatted supers, one for the Heddon super, 4 for wide frames, one for section-holders, 6 for T supers, and one for his own arrangement. For wide frames there are Messrs. Doolittle, Pringle, Pond, and R. L. Taylor. Please tell me how you make 6 out of them. For section-holders, J. A. Green. Please tell me how you make 6 out of him.

Marengo, Ill., March 28.

P. S.—Do you have tuition in advance? If so, send on your bill.

[If you turn to the editorials in that same issue, June 1, wherein that footnote is conspicuous by its absence, you will see that I there stated that, owing to ill health, the preparation of that number was delegated largely to others. It seemed *at that time*, at least, that I should *have* to give up all office work entirely; and it is not much wonder that I did not put any footnotes in that and the subsequent issue in some places where they were needed. If I could have had my usual health, I should have put in something at the end of the article a good deal as you have outlined. At all events, I indorse it word for word. Yes, it is what I ought to have written, but could not; and, thanks to the beef diet, I firmly believe I shall never get back to where I once was.

Regarding those figures: Now that *you* have been humiliated, you would humiliate me by aiming your darts (questions) at me instead of Mr. Taylor. Pray, did you consider me a more vulnerable target than Taylor? He made the statements that you ascribe to me: I simply indorsed them by stating that my count tallied with his. Well, if I am to father them to that extent, all right.

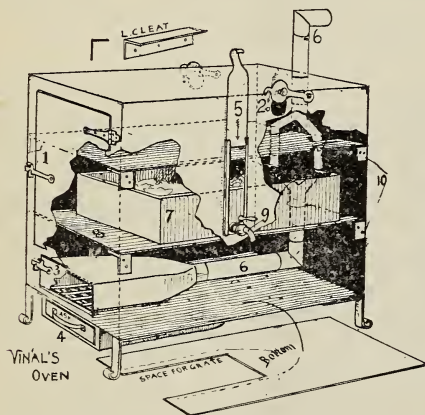
We all three count 6 in favor of the T supers. When I checked off the Question-box, page 111, of the *American Bee Journal*, I put a letter T opposite the names of the T-super men; S after the section-holder advocates; and W opposite those who preferred wide frames. In going back over my file I find 6 T's and 6 W's. Mind you, these letters were put down before I had read Taylor's article through to know what his count was; and when I found that my count tallied with his I naturally concluded that he had counted right. Well, I think so yet; but I believe I see where your count differs from mine on the wide-frame matter. I will not say Taylor's, because I do not know

what names he included. In addition to the names that you have given, I have on my tally W. R. Graham and Eugene Secor. Perhaps you did not consider Graham a wide-framer, but I did and do now; and Secor is a wide-frame man if he is any thing; and yet I can see how you can claim him for T supers. I can explain the apparent difference of count only on the supposition that your eyes were trying to see T-super votes, and that my eyes were equally eager to see wide-frame and section-holder votes. Wide frames and section holders are practically the same thing, but in my tally I took account of wide frames pure and simple. —Ed.]

VINAL'S OVEN FOR LIQUEFYING HONEY.

By Geo. L. Vinal.

Most of the honey-producers who peddle honey in jars or pails find that most people think granulated honey is mixed with something. At the low price of honey, we have to do as little handling as possible. In drawing honey from the extractor into jars or pails it will candy, and it is sometimes more convenient to label jars and pails before they are filled. Now, in liquefying it in water we loosen the labels and have to replace them. In order to avoid this trouble I had an oven made of galvanized iron, that works well with me in melting honey, either in glass jars, pails, 60-lb. cans, or bulk.



It is made $4\frac{1}{2}$ feet high, 21 inches wide inside. It will hold six 60-lb. cans, besides about 200 pint Mason jars, at one time. It will burn either coal, coke, or wood. I prefer coal, as it gives a more even heat. I can regulate the temperature to any degree I wish.

It takes from six to eight hours to liquefy a 60-lb. can of solid honey, at a temperature of from 135 to 140°; pint and quart jars, from one to two hours, or longer, according to the heat.

I will try to describe the oven. It is 21 inches wide by 21 deep, and $4\frac{1}{2}$ feet high. One side is a door that closes tight against a flange. It has a ventilator on each side near the top. The fire-box is one foot wide, 18 inches long, and six inches deep, made of heavy sheet iron.

The grate is made of tire iron, $\frac{3}{8}$ thick by $\frac{3}{4}$ wide, riveted together by three cross-pieces of the same. The fire-box is connected by a funnel that runs up behind and comes out through the top of the oven, and acts as a chimney. If you use it in a room without a chimney in it you can lead it through a window, or use it in a shed, or out of doors, if you like. Shelves placed on brackets are arranged so you can take them out as you like. Mine cost me about \$6.50. I would not sell it for twice that amount. There is a tank that goes inside in which I melt honey in bulk. This has a faucet leading through one side of the oven. It holds about 350 lbs. of honey. As it melts I draw off and put in more from the barrel. It comes handy for several things. I evaporate about fifty gallons of maple sap to as fine syrup as one ever saw, and no danger of scorching or burning. You can bake beans, bread, puddings, pies, melt wax, and in the summer time not heat up the house.

I think it would pay any one to have one of these ovens if he has much honey to melt. My reasons are these:

1. You can set it up in a shed, or out of doors.
2. After the fire is built, it takes very little fuel and care to keep it going.
3. You can leave it and not be afraid of burning the honey.
4. You are not fooling around with water to spill and slop, and soak off labels.
5. It can be used for several things, and it will not cost much more than a boiler.

I do not make them nor have them for sale. I give my experience to the bee-keepers for what it is worth.

Charlton, Mass.

HOW TO GET GOOD PRICES.

SELLING HONEY IN GROCERIES; HOW TO MAKE IT SELL.

By S. C. Corwin.

In the summer of 1885 I got my first crop of honey in Florida, being nearly 1000 lbs. in $4\frac{1}{4} \times 4\frac{1}{4}$ sections. I took seven 48-lb. cases (these cases were made by A. I. Root, and were glassed on both sides), and one case holding a single double tier of eight sections. This case being glassed both sides, and comb very white, it was remarkably pretty. This was my sample case to sell by. I took this honey to Tampa, calling on the leading merchants, trying to sell. All exclaimed, "How fine!" Honey in this style was new in Tampa; but all told me, "We can't sell it at your price. 12½ cents per section. We can get all the broken comb honey in cans we can sell, for 6 cts. per lb." I felt quite blue, for I expected to make the honey business my support. I at last decided to take my sample case, which I had kept wrapped up while on the streets, in my hand unwrapped, and walk the streets, feeling that it would attract attention, it being a new article in this city.

Before starting out I made a bargain with the leading grocery firm located in the center of the city, having a large show-window to stack my honey in. They were to sell it at 12½ cents. If they sold it I was to have my pay in goods; if not sold at the end of a month I would remove it and pay rent for the window.

After making a pyramid of my honey in the window, I started out with my sample case unwrapped, feeling somewhat bashful. After being stopped several times, and complimented on the beauty of my honey, I began to feel in good spirits. I went to the postoffice and stood there awhile, cutting one of the sections and giving it to the crowd. Every one asked to buy a section. I referred all to the firm where I had left my honey. After doing the city, and giving the eight sections away in small samples, I left for home. This was Tuesday. The next Tuesday I received a letter saying, "Send 500 sections at once. We are all sold out."

The following year I tried them on extracted honey; but they said, "We can buy good *strained* honey for 50 cents per gallon, and you ask a dollar. We can't sell yours." I tried the same game of leaving it on sale; but instead of putting it up in old syrup-barrels I took *new* one and five gallon cans; sent to A. I. Root, and had labels printed large enough to cover one side of a five-gallon and to wrap around the one-gallon cans. These labels had a cut of the Novice extractor, and told what extracted honey is and how taken, and my name and address. That firm still handles my honey, and uses over one ton a year. I let my extracted honey remain in the hives till all sealed, and sometimes for two months. It is quality, not quantity, that I am after. This is the kind of honey that keeps for eight years as good as new, and never candies. In this time other firms have bought my honey, and I find no trouble with good goods and a guarantee of purity on every package, to sell clean every year.

Sarasota, Fla., March 26.

STATIONARY OR LOOSE T TINS.

A REPLY TO MR. HILTON AND OTHERS,

By Miss Emma Wilson.

On page 218 Mr. Hilton says, "I can see no advantages in the loose tins that the stationary tins do not possess. With me a super is more easily filled or emptied with stationary tins than with loose ones, especially when the thumb-screw device is attached." I am perfectly willing to let Mr. Hilton use stationary tins if he likes them best, but I can not see how a super can be either filled or emptied easier with stationary T tins. I am very sure I can fill them very much quicker and easier with loose tins, and I have filled a good many both ways.

When I first began filling the supers I used to put in eight sections, four on each side of the

super, first thing, and that practically made the tins stationary for the rest of the sections, and it took me very much longer, and was a good deal more troublesome to put in the remaining sixteen sections than it takes me now to fill a whole super. Yes, sometimes I fussed a good deal longer in getting one section in its proper place than it takes me now to fill a whole super; for by the present way there is never any trouble whatever.

You are mistaken, Mr. Editor, when you say on page 218 that I put in a T tin before putting in the first row of sections. No T tin is put in until one row of 6 sections is in place. Then in less time than it takes to tell it, the T tin is slipped under the whole row. As I have already described this method of filling (page 179, 1895), it is not worth while to repeat it.

I should like to ask Mr. Hilton if he has ever tried to fill supers in this way. If he has not tried it he is hardly competent to judge which way of filling is easier. I had a good many years' experience in filling them the old way, and thought I knew all the kinks. I can't say I ever enjoyed filling them; but I should feel a good deal worse about it now if obliged to go back to any of the old ways.

Now as to the thumb-screws: In place of them we use a wedge, which I think answers the same purpose.

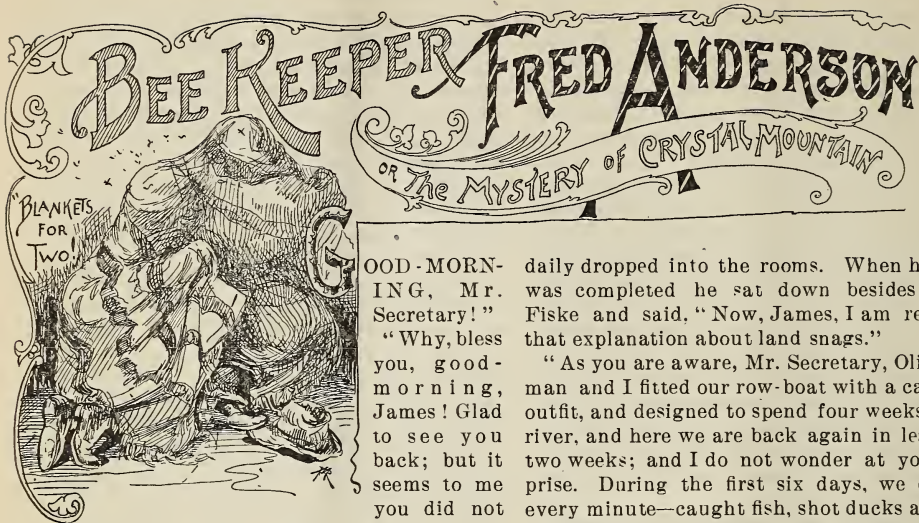
I can not understand how stationary T tins make it any easier to empty a super. If the T tins come out of the super with the sections I can not see how they are any obstruction; and if they are glued to the sections, and are stationary, they must make it harder to empty the super; and I know ours often have to be loosened. In any case, I don't see how being stationary can make them stick any less.

We can remove the full sections from the supers during the harvest just as well as if the tins were stationary, and have often done so. This, however, we never do during a good honey-flow, but only when honey comes in slowly.

Now as to cleaning the T tins, of which the editor speaks, quoting Mr. Harry Lathrop. I, like Mr. Lathrop, have scraped a good many with a knife, but that was before I knew any better way of cleaning them. You don't catch me scraping any more; and I don't believe Mr. Lathrop would either after trying cleaning them with hot water and lye. The editor says, with hot water; but hot water alone is no good. Now, I admit that T tins can be scraped with a knife; but it's a disagreeable job; and look at the time it takes. I've spent days scraping the same amount of T tins that I could clean in a very few hours with hot water and lye. And then, compare the tins when finished. The T tins that were cleaned with hot water and lye are just as clean as when new. They may not be as bright, but they're just as clean. Those that are scraped are not—at least, I never succeeded in removing every trace of propolis; and while scraping helps very much, it does not entirely clean them.

Marengo, Ill., Mar. 27.

[As to my statements concerning your ways of working, I stand corrected.—ED.]



GOOD-MORNING, Mr. Secretary!"

"Why, bless you, good-morning, James! Glad to see you back; but it seems to me you did not spend so

much time on that outing as you planned. Camping in the river bottoms and among the tules did not agree with you, I warrant; and you were glad to return to the comfortable ways of city life. Olin is back too, I suppose?"

"Yes," James replied; "we both returned. The weather, the boating, fishing, gunning, and camping were all delightful. We were enjoying it immensely when, in river parlance, we ran into a snag, and the result you see before you. I am here."

"Well, James, I have been in a boat several times up the Sacramento, and have found those snags a troublesome factor; but I can not imagine how a river snag could wreck a row-boat with two wide-awake young fellows like you and Olin Fursman in command. I shall have to call you to an account, and expect an explanation."

"While our boat was not wrecked, Mr. Hopson, I agree with you that we ought not to have run into a snag; but you are aware that a great many kinds of snags are in the river. Some stick up so plain that they are easily avoided; others are hidden, and we are liable to run into them before we know it; then there are others that are enticing, and we get into them through curiosity or by a desire to experiment with things we know not how to manage. The snag we ran into was of the latter order, and a land snag at that."

"Worse and worse, James; but wait a moment. I wish to post this bulletin for our Sunday meeting on the bill-board outside, and then I will listen to your story."

Mr. Hopson, the acting secretary of the Sacramento Y. M. C. A., was a cheerful man, and went about his duties humming a popular gospel air. His readiness to lend a helping hand here, and a word fully spoken there, was exerting a good influence upon the young men who

daily dropped into the rooms. When his work was completed he sat down besides James Fiske and said, "Now, James, I am ready for that explanation about land snags."

"As you are aware, Mr. Secretary, Olin Fursman and I fitted our row-boat with a camping-outfit, and designed to spend four weeks up the river, and here we are back again in less than two weeks; and I do not wonder at your surprise. During the first six days, we enjoyed every minute—caught fish, shot ducks and other game, and lived upon the best that land and water could afford. We usually found good camping-places on shore. When we did not, we slept in the boat. We rounded Lone Tree Point Saturday afternoon; and about one mile above, we found a delightful camping-place in a grove of sycamores, and proposed to spend Sunday at this place. We had labored at the oars so much that we looked forward to a day of rest, with no little pleasure; then we had books and papers we had scarcely looked at, and anticipated many hours for reading. There was an old deserted cabin near by, and we discovered it had been formerly occupied by a bee-maker."

"No, James, you mean a bee-tender, or honey-maker," said Mr. Hopson, in a tone of superior knowledge.

"It had *bee* to it, sure enough," said James, "for we discovered an old pile of empty bee-boxes, and three boxes that had bees in them; but we merely made a reconnoiter that evening, and arranged our camp near the cabin, under the sycamore trees. We were usually tired enough to sleep sound and to have an excellent appetite for our morning repast; and the rule was not an exception in this camp. When we were preparing our breakfast that Sunday morning, Olin suddenly proposed that we have some honey for breakfast. 'This is an old deserted ranch,' said he, 'which nobody owns, and we might as well have honey on our flap-jacks as not; then we can get enough out of the hives to last us several days. It's a go, Jeems. Hurrah for the honey.' I told Olin we might get more stings than honey, and then there might be an owner who would be vexed at the liberties we were taking with his property."

"Don't believe there has been any one here in two years," exclaimed Olin; "just see the big weeds, the willows, and water-motors that are

growing here. Then there are only three old tumble-down boxes that have bees in them. To get the honey is just as easy as rolling off a log. My uncle has told me lots of times how he and the soldiers used to do it, when on the march. Just wrap the hive in a blanket, and plunge the whole business into the river, and in ten minutes we can have some delicious honey.

pile of old bee-boxes, I plunged into it. The bees charged in force upon the part of my pants that did not get in, and, having on thin clothing, the charge was effective. Each *bee was like a bullet*, and bound to go clear through me if it could. I made a further desperate lunge, and the pile of boxes was unequal to the upheaval, and they tumbled in every direction, leaving

me again without protection. I scrambled through the weeds as best I could to the cabin, where I found Olin under the blankets. 'Blankets for two!' I shouted, and I enveloped myself as promptly as possible. The bees that followed us persistently fought us, even in the cabin. It was not a pleasant situation, muffled in blankets, and suffering pain from swelling punctures on face, hands, and various portions of the body. We could not endure our imprisonment, and simultaneously made a break for the river, with blankets over our heads. Here we washed and scraped off the stings, and during the process I asked Olin if he felt the *honey trickling down* his throat. His nose had a growing protuberance on it; an eye was in a fair way to swell shut, and his lip protruded abnormally. His reply was a dangerous look, and I did not press my

inquiry. My face was not one whit more prepossessing than Olin's; and, upon the whole, we were a gruesome-appearing couple."

To be continued.

"STRAINED" FOR "EXTRACTED."

WHO IS RESPONSIBLE FOR THE TERM?

By Elias Fox.

I almost feel it trickle down my throat now. Here you are,' said he, as he hunted up a gunny sack and ripped it open so that it would spread well. The problem seemed so simple, and he went about it with such vim, that I put aside my scruples about the right and wrong of the transaction, and we approached the hive that was only a few yards from the river. We tramped the weeds down in the rear of the hive, and spread our improvised blanket. The morning was somewhat foggy, and the bees were not flying very numerous, and these did not seem to realize that enemies were abroad.

"The hive was carefully placed on the blanket. 'So far so good,' said Olin, as he grasped two corners of the blanket and I the other two; 'now steady for the river;' the hive was real heavy, and we had taken but a few steps when there was an ominous tearing sound, and the hive went through the old gunny sack to the ground, with a thud. If there was but little apparent life in the hive before, the inhabitants made up for it now. I have heard the expression, *there's millions in it*, but never realized it so tangibly as now, for it seemed a million of bees that made a charge upon us, and our retreat was upon the order of getting away quick. Olin made a dash for the old cabin, some rods away, with a whole cloud of bees for an escort, and his arms gyrating about his head. Seeing an opening, partly hidden by weeds, under a

In regard to the word "strained" honey being used instead of the proper word, "extracted," it is my candid opinion that the producers themselves are largely if not wholly to blame. In the first place, it is the ignorance of the consumer, and the producers themselves are to blame largely for not educating them as to the difference between "strained" and "extracted" honey. Every one knows that, in the days of our forefathers, the only liquid honey produced was by straining a conglomeration of honey, comb (old and new), bees, brood, and pollen, and the product was called "strained" honey; and thousands of people to-day who called for strained honey don't know but the extracted honey is produced in the same way. The majority of them never saw or heard of an extractor; and the larger portion of those who have heard of it think it is a machine for hastening the old method, and the bee-keepers have allowed them to remain in the dark, and



"DO YOU FEEL THAT HONEY TRICKLING DOWN YOUR THROAT, OLIN?"

even allowed the word "strained" to follow their extracted to the city. When neighbors call for strained honey, why don't you tell them that you haven't any, but that you have "extracted," which is much better? and explain the difference to them; invite them to visit your apiary at extracting-time; show them the whole manipulation, from taking the combs from the hive to filling the five-gallon cans and boxing them for shipment. Invite them to eat freely of honey during their stay. This is about the only means of convincing the public that your honey is pure, and that it is extracted instead of strained; and whenever a commission man or any other dealer is known to use the term "strained" he should be corrected, and then the word will soon be one of the past; and the sooner this is accomplished, and purity guaranteed to the consumers, the sooner "extracted" honey will find a better demand, and at better prices, remembering that the proof of purity will have as much (or more) weight as the word "extracted."

S. T. Fish, p. 16, has a first-class article on the importance of having a neat package for comb honey, and this should apply with equal weight to extracted-honey packages. The fact of using old oil-cans would be as detrimental to our pursuit as to return to the old system of producing strained honey (bees and pollen).

I notice a report of J. Z. Rhodes, of Verndale, Minn., in the *American Bee Journal* for Jan. 2, which states that he began the season of 1895 with 39 colonies, and increased to 150, and harvested 3000 lbs. of comb honey and 3000 of extracted. He claims to be a beginner, and that he knows but little about the business. I advise him to remain in the dark, as he will not meet with such success as this after he is out of the A B C class, especially these drouthy seasons.

ELIAS FOX.

Hillsboro, Wis.

FULL SHEETS OF FOUNDATION IN SECTIONS.

THE MIDRIB OBJECTIONABLE TO CONSUMERS;
A VALUABLE ARTICLE.

By John Handel.

Is the too liberal use of wax reducing the consumption of honey? This is a matter worth inquiring into. Wax in comb honey is an adulteration; and the consumer who has not yet learned how to swallow it is not easily convinced of the fact that only a small proportion is artificial. The stack of cuds left after eating a small chunk of comb honey will arouse his suspicions; and upon inquiry he is satisfied that the article has been tampered with; and the small-quantity argument (1 or 1½ per cent) will not down, any more than the wax itself, even if shown that the adulterant is higher priced than the combination; consequently, consumers, once satisfied that the solid structure, or comb, is doc-

tored up by us, how can we expect them to have any faith in the filling? All but those who are wilfully blind will notice the so-called "fish-bone," as the knife or teeth pass through this artificial center of comb honey, even if it be "extra thin" foundation. Therefore, while trying to deceive others we may be injuring ourselves.

NOTHING NEW UNDER THE SUN.

After reviewing the ground that bee-journals have gone over in the past year I find very few short cuts and easy methods offered—nothing to encourage us to make an extra effort this year. On the other hand, it appears to me as though every correspondent took a special delight in "knocking the stuffing" out of the most promising new features put forth the year before. Those automatic contrivances, which are watched with anxiety by the sidewalk bee-master, were kicked about until of late I see nothing of them any more. Yet how nice it would be to have a hive built on the principle of the "penny in the slot" machine! We could then "push the button," and the bees would do the rest.

While dealers and commission men are getting a "roasting," some of us might as well look up the other side, and thaw out some of the producers. In the past ten years I have produced, probably, seventeen tons of comb honey. About 80 per cent of it was shipped to a distant market, some to commission men; but most of it was sold to dealers. Out of this whole amount sent, I had a loss of less than 50 lbs. from breakage; 19 lbs. was stolen while in transit. My returns (when the price was not agreed upon) were always satisfactory. But my success in this line led me to speculate. I bought a lot of honey from otherwise reliable and honest producers, and, judging from what I could see through glass, perfectly competent in grading honey. So I shipped it without opening the crates; and for that reason, or some other, that honey broke down, leaked, got wormy, and they said all but the front row (that next to the glass) was dark. I wrote and told them what it cost me, and asked them to try to get that much out of it. The amount was sent me, but they said it was not worth it, and that they did not want any more honey from me.

DRAWN COMBS IN SECTIONS.

Dr. Peete, p. 102, expressed it exactly when he said that sections put on a hive a second and third time look like old nest-eggs. I too have learned the value of drawn comb; but the labor of extracting the honey from the partly filled sections is what I dread. And right here I would ask B. Taylor how to overcome this (to me) difficult task. Does he uncup them with his handy comb-leveler?

While extracting those partly filled sections a great many of the combs break out, evidently because I "haven't learned the trade yet" (see page 103). Is there any other advantage claimed for that "bottom starter"?

Most colonies, if managed rightly, will build down to the bottom of sections; and if a colony insists on leaving a bee-space I find it less trouble to pinch the top starter from that queen than to put a bottom starter in all the sections. Now, instead of extracting the honey from partly filled sections, I break or tear the cappings, and also the cells, to within about half an inch of the center, or base; then if some colonies are short of stores, a super full of those dripping sections will make them hustle while extracting, trimming, and keeping robbers away. Or if those sections are left a few days in a warm damp atmosphere, nearly all the honey will run out; then let the bees do the rest. Then to make this drawn comb go as far as possible, I cut it out of the old sections, divide it in two or three pieces, then dip the long side of each into melted wax, and quickly press in the top of a nice clean section.

STAINED SECTIONS.

How to prevent bees from staining and varnishing the sections has puzzled my mind a great deal. Smoothing the way for the bee that is loaded with propolis will accomplish much; and I have an idea that every thing being smooth inside of a hive very often saves that bee the trouble of gathering a load of varnish. But the numerous little cracks, and uneven surface between sections, offer great inducements to the little plasterers, especially along toward fall. Accurate fitting, and wedging sections in tight, will remedy the matter to some extent on the inside of sections; and if Mr. B. Taylor will allow me to use his expression, I will say that, whoever allows his bees to come in contact with the outside of sections, "has not yet learned his trade."

PREVENTION OF PARTLY FILLED SECTIONS.

Like Mr. B. Taylor, I give my bees plenty of room, so as to discourage them from swarming during the honey-flow; but instead of "piling on an unlimited amount of supers, with sections, at or near the end of the flow," I put on super-holders fitted with top-bars only. A set of top-bars, or lath, with $\frac{3}{4}$ -in. starters, are fitted over the super-holder, and a set of pattern slats to the bottom. Should the bees fill this entirely with honey, they of course will fasten the combs down to the pattern-slats. But they will peel off; then cut the end of the combs from the holder, and you have nice half-depth combs that will sell or extract easily. I have even shipped them (before cutting them out), and they sold like hot cakes, probably because it was in a new form.

Savanna, Ill.

[Very many, and perhaps a majority of our honey-producers, use full sheets in sections, and it is no doubt true, as you intimate, that such sheets cause more of a fishbone than the narrower starters. We as bee-keepers do not object; but consumers, not knowing any thing about foundation, jump to the conclusion that such comb honey is "manufactured." There

is now chance along the line of making use of thinner foundation; and the new process gives us hope that we can use such an article, and yet such sufficiently strong so that bees will not tear it down.

I have for some time advocated supers in which compression of the sections is a feature. On my first bicycle-tour I observed that the bee-keepers who used crates or supers that would squeeze sections tight had less propolis along the edge of the sections than those who did not use compression. To secure this more perfectly, the section-holder super was devised, with wooden separators, and wide enough to reach the whole depth of the section.—Ed.]

GOVERNMENT AID TO BEE-KEEPERS.

THE KIND OF ASSISTANCE NEEDED, AND HOW TO GET IT.

By W. K. Morrison.

There is no more vital question to bee-keepers than this: "What can be done to advance the sale of honey?" I shall make the statement without fear of successful contradiction, that no people are so prejudiced against honey as the Americans, and for good reasons. The newspapers, in season and out, have persisted that the American bee-man is nothing but a cute rascal. There is hardly an "influential" paper in the country that has not given space to the "Wiley lie," or something like it. It should be noted, too, by all our fraternity, that one reason why Prof. Wiley succeeded so well was that he was a government official, supposed to be well posted on agricultural matters. I am also sure of another thing, which is, that, had Mr. Wiley made similar assertions in regard to bee-keepers while in the employ of either France or Germany, suitable punishment would have been immediately dealt out to him. In truth and in fact, his reputation would have been damaged for life. Bee-keepers who live in the country have little conception of the extent to which public opinion has been led astray in this matter.

Another thing, many people have been led to put up their honey in bottles marked "extracted." Now, if such would only inquire among their city friends they would find out that "strained" is what people want. The "extracted" suggests machinery. When I bought my "Cowan" I found a strainer attached to the machine. What was it for, Mr. Editor? On a close inquiry you will find that lots of people "like the good old strained honey." My advice is to put neither "strained" nor "extracted" on your packages. Sell it for honey. But just here somebody says, "What has this to do with the government?" so I must change.

One reason, and the great reason, why the bee-keeper fails to sell his honey at a reasonable figure is that people do not understand what a valuable product he has produced, so it becomes his duty to educate the "masses." I propose, however, that we *compel* the recogni-

tion of our business by the government, who will help educate. Senators and Representatives know nothing about the pursuit, but they are doubtless willing to learn a little. At the same time, we might take the newspaper men under our wing and give them a bagful of news. One of the features of European life is shows or exhibitions of many home pursuits. Lately Americans have taken very kindly to similar affairs at home, and we now see poultry, dog, horse, and even cat shows an annual "function." Now, does it not seem rather strange that the cat-men were able to hold the attention of the public, and yet no effort made to advertise the industrious bee and its delicious product?

What I now propose is that we have a national bee and honey show, and that we hold the first exhibition in the city of Washington, in the month of September, 1896, and intrust the local management to the officials of the United States Agricultural Department. It would serve to enlighten them in regard to the value of bee culture, and stir up their energies. The opportunity ought to be taken to have an immense sale of honey after the show. The honey-dealers of Washington, Baltimore, Philadelphia, and New York would need to be there, and buy their honey on the spot. No "sight unseen" about this method. My reasons for selecting Washington are that we could secure more help there, as our cities do not contain, as a rule, many large bee-keepers. Another thing, it would secure a support from Congress that can not be had otherwise. In fact, the officers of the government could shut their eyes no longer to the importance of the bee-keepers' art.

Many comments have appeared from time to time in regard to the unjust treatment accorded the apian interest; but I think we may blame that on our laxity in asking for help. A large acquaintance with the members of both houses of Congress leads me to say that there are but few of them who would not vote money freely to assist us, provided we are true to ourselves. All they ask of us is that we bee-keepers show what we can do. Cities often throw out inducements for a good show, and Washington is not behind the age in any respect.

Over every entrance, and placarded all about, would be an inscription reading like this: "Ten thousand dollars reward to any man who can make a piece of comb honey by machinery, or who can produce any proven to have been made by any means other than bees." Our supply-dealers would all make a good show at such a display. This alone would assist the public to a better knowledge of the bee and honey trade. Persons having large quantities of honey for sale would send it to the show to be sold. Suitable displays of all apian inventions would attract many observers. There should be a good display of honey-flowers. The bottle-

manufacturers would not forget us. Methods of using honey would not be overlooked, and so on. The North American could be held there, with a chance of an audience. Last, but not least, every bee-keeper who intended visiting the show would send a letter to his Congressman, telling him of his anticipated trip, inviting him to meet him at the show. I see no reason why bee-keepers should remain in the background any longer.

Devonshire, Bermuda.

[Mr. Morrison makes a good point when he suggests that we need to secure the assistance of the general press to educate consumers in regard to our industry. The press, through the instrumentality of Prof. Wiley, did us a most irreparable damage, and this same agency is the one to repair the damage, if done at all. I believe friend Morrison's plan is feasible, and GLEANINGS is ready to assist in any way possible; but I would suggest that the plan be laid before the Bee-keepers' Union or the North American, or, better still, before the new Union that may be organized. If sanctioned by such a body it could then be taken up by the bee-journals, and pushed for all there is in it. With a big bee and honey show in Washington there is no question at all but that the newspapers of the country would give us long write-ups; and such notices would go a long way to counteract the Wiley "pleasantry."

If the other industries of the country can afford to have such shows, the bee-keepers of the land ought to have them; and if we can not secure the funds from the national government to defray the expense, let the Union take hold of it, and, if necessary, disburse some of its funds already in the treasury. I can see no way in which money could be more judiciously expended than in that line. The supply-dealers of the country will be willing, I think, to do their share.

I should like to have this subject discussed, so that it may, after proper deliberation, be laid before some national organization of bee-keepers.—Ed.]

A CAPITAL METHOD OF SELLING HONEY DIRECT, WITHOUT SOLICITING OR PEDDLING.

Some years ago, when I began to produce honey by the ton, I relinquished the home market, leaving it to small producers, although I have still a considerable local demand. I have not offered a pound of honey to any one in this town of 8000 inhabitants for over ten years, and I have never since been able to meet the demand without purchasing from others. How have I found my customers? you may ask. This is how: I took up "Bradstreet's Report," and turned to Manitoba and the Canadian Northwest. In every city, town, and village I selected and listed the names of grocers, druggists, and fruit-dealers, taking great care to enter the names of none but those who were rated as "good." To each of these I mailed a price list (one of which I inclose, which you will notice is dated seven years ago, and is the last I needed to send out). From that day to the present I have not had to seek a customer.

Owen Sound, Ont.

R. McKNIGHT.

FRANCE'S REPORT FOR THE LAST FIFTEEN YEARS.

AN INTERESTING SERIES OF FIGURES; THE PAST SEASON SO POOR THAT, INSTEAD OF FEEDING, THEY KILLED THE BEES.

By E. France.

In glancing over my records for three or four years I find that we have not done as well as we did in former years. In looking back I find I have records back to 1877. We always got some honey—enough to winter the bees, and some to sell.

In 1880 we had 124 colonies; extracted 6000 lbs., and called that a poor year. We let out on shares about 50 colonies. In the spring of 1881 bees wintered very badly, for it was a very hard winter. The partnership yard went down from 60 to 3 weak colonies. The cause of the loss was a location too windy, a long winter, and a too free use of the extractor. We got, however, that year, 4000 lbs. extracted. We had, in the fall of 1880, all told, 220 colonies, but all were extracted too closely; and, having had a hard winter, we were obliged to feed heavily in the spring of 1881. We saved only 75 colonies, and increased to 157 in the fall. We extracted 2000 lbs., but were careful to leave the bees enough to winter on. By this time we had learned that it did not pay to extract too closely. About this time we began to get our bees into chaff-lined hives, and we packed all the bees with chaff cushions and straw to the best of our knowledge, all out of doors.

In March, 1882, the weather was open, and up to that time bees had wintered well. My record does not say how many colonies we had that spring; but we took 13,000 lbs. of extracted honey, and went into winter quarters with 295 colonies.

In the winter of 1882-'83 we lost very few; but they deserted badly in the spring. We got into working order with 211 colonies. That was a rainy spring. White clover was a big crop. We commenced to extract June 26. Basswood began to blossom July 1, and was done the 23d. It rained so much during the basswood flow that all the bees got from it was a winter supply. The amount of surplus was 22,059 lbs. I have no record of the number of colonies in the fall.

In 1884-'85 the number of colonies was 291; fall count, 455; extracted honey, 31,283 lbs.; comb honey, 206 lbs. This season was followed by a long and cold winter, during which there were 40 days of zero and below. It was first below zero Nov. 24; 12 below the 25th. The coldest day was Jan. 22, which was 34 below. January was a very cold month—15 days below zero. Bees had their last fly Nov. 15. Feb. 3, the temperature at noon was 40. Bees came out some, and many fell on the snow. We got through the winter and spring of 1885 with 321 colonies out of 516—good, bad, and poor. Surplus extracted was 30,079 lbs.

The winter of 1886-'87 was a pretty cold one—much snow, followed by rainy spring and muddy roads. We sold one apiary of 50 colonies, shipping them to Broadhead, Wis. From these 50 colonies was taken 10,000 lbs. of honey that summer. We started in the spring with 395 colonies; increased to 507 in the fall, and extracted ourselves 42,489 lbs. After the honey season we had dry weather, which killed out the white clover except in low ground, and but little left there. In the fall of 1886 we had 507 colonies, of which we lost 97 as follows:

Home yard, fall,	66;	spring,	61;	loss,	5
Cravin " "	113;	" "	104;	loss,	9
Burney " "	76;	" "	74;	loss,	2
Watters " "	89;	" "	68;	loss,	21
Adkins " "	94;	" "	45;	loss,	49
South " "	69;	" "	58;	loss,	11

Total - - - 507; " 410; 97

We had, therefore, 410 colonies to commence the spring of 1887.

From the above report it will be noticed that there was a great difference in the winter loss. This was caused by extracting too much from the Adkins, Watters, and South yards. Those three yards were extracted the fourth time. No other yard was extracted more than three times. There was taken from the Adkins yard, June 26, 1464 lbs.; South yard, June 25, 1368 lbs.; Watters yard, June 24, 1829 lbs.—making a total of 4661 lbs. It is plain that we lost the bees by extracting too late, as it was just at the close of the basswood season. But after all that, 4661 lbs of honey was worth, at 6 cts. per lb., \$279.66. How much more would the bees have been worth? We got the cash for the honey, and had 410 colonies of bees left, and the seasons have been very poor since, so I think we are just as well off. But it was bad management that caused so great a winter loss. Bees, to winter well, must have plenty of *good feed*.

Owing to the dry weather in the latter part of 1886 we got only 5000 lbs. of honey from our 410 colonies, spring count. We went into winter in good shape.

In the spring of 1888 we had 431 colonies. It was wet; but owing to the dry weather the previous year, we got only 11,629 lbs. of extracted, 195 comb, and increased to 588 colonies.

In the spring of 1889 we had 531 colonies, and secured 26,070 lbs. of extracted honey. This was a dry summer, and there was no white clover for the next year.

In the spring of 1890 we had 649 colonies. The winter was mild, and bees wintered well. It was warm in March and April, and cold and dry in May. The last of May and first part of June was wet and cold. White clover was scarce. June was a wet month, and no clover honey, and very little from basswood. We extracted, however, 3125 lbs. Of colonies, fall count, we had 661.

March, 1891, was a cold month, with a foot of

snow. The first half of April was wet and cold. April 20 all the bees were looked over, and fed some. May was dry—too dry for clover, and we had 12 frosts in May. June gave us some rain. Colonies, spring count, were 580, and the honey crop was 30,000 lbs.

In the spring of 1892 the number of colonies, spring count, was 620. That was a poor year for honey—too wet; very rainy season; thousands of clover-stalks came up from seed, and grew finely. The bees barely made a living, getting nothing from the clover. July 11 was the first day that we could open a hive without using a tent. The bees got a little honey from basswood, but not enough to winter on. We fed 14 barrels of sugar, and it looked as if 1893 would be a good honey year, and that we should have to save the bees if possible, so we fed and fixed them up as well as we knew how.

The winter of 1893-'4 was a very hard one—deep snow, and a very cold average. The condition of the bees was not as good as during the previous year. It was cold and wet through March and April. Bees had to be nursed carefully to save them. May 1, queens quit laying; no uncapped brood in the combs in any of the colonies; cold wet weather until the 8th of May; then it turned off warm, and egg-laying commenced again. We lost a great many bees. When we got into working order we had 323 colonies alive, some of them weak. Clover was very abundant, but there was not much honey in it until June 20. Then we had a busy time until July 20, when the basswood was finished; and by that time the clover was all dried up. What young clover there was from seed was dead. In 1893 we extracted 39,245 lbs. of honey, besides taking honey in brood-combs from the home yard—over 2000 lbs.—that I put into our comb-room for feeding, if it should be wanted. All the bees went into winter quarters well supplied with honey.

In the spring of 1894 we had 426 colonies—spring count. May 28 the bees were in good condition, but there was but little to gather. The drouth killed the clover the previous year; cold and hot by spells, getting too dry for grass, and it was a very dry summer. Bees got a winter supply from basswood, and we extracted 3700 lbs.

In the spring of 1895, owing to the very dry weather since June, 1893, nearly every thing was dried up. There was no hay that year, and oats not a fourth of a crop, and very little corn. Small fruit plants died. We had four acres of blackberries, and all died—not a single berry last year. We had a late frost that killed the most of the basswood-blossoms. There was no clover. We fed some to keep the bees alive, in hopes they would get a winter supply from basswood. Vain hope! They got some; but when fall came we found ourselves obliged to feed heavily or let the bees starve. We

bought 7 barrels of sugar; fed that, and killed 160 colonies, and let the other bees take what little honey they had, saving the combs. I do not know how many colonies we are trying to winter—about 300, more or less. Why did we not feed all? First, want of money; second, I didn't think it would pay. Clover is all dead—no prospect of a honey-crop next year, and the case is very different from what it was in the fall of 1892. Then there was a big crop of clover on the ground. It looked then as though it would pay to feed, and it did; but now every thing is dried up. If it is as dry next year as it has been the last two years, there will be nothing raised about here. Wells are giving out in all directions. Well-drillers are busy sinking wells deeper. One man had a well 80 feet deep. He bragged about his well being so strong; but it gave out. He has drilled 120 feet below the bottom, making the well 200 feet, but no water yet. My nice large Dutchess apple-trees are nearly all dried to death. My sister has a fine grove of oak timber about her house. Three-fourths of the trees are dead. Drouth did it. I just mention these things to show how dry it is here. There has been a great deal of rain in the north part of this State this summer, but we have been skipped.

I hated dreadfully to kill the bees, but who can blame me for doing it? Perhaps some would like to know how we did it—kill the bees and let the other bees have the honey. First we examined them all in the yard. Nearly all had some honey in most of the combs, at their tops. The amount varied greatly. Some would have enough to winter, some half, some less, a few nothing. We parted the combs so we could see what they had, and marked on top of the honey-board 2 or 4, 6 or 8, or "kill." Those figures meant so many 3-lb. feeders. Then we put on the feeders of sugar syrup. We would then go to a hive marked "kill," and, with the smoker filled with tobacco-stems afire, blow into the hive a thick smudge of smoke. That made the bees helpless. Then we opened the hive and swept the bees off the combs and out of the hive into a box, setting the combs outside of the hive. The other bees would pile on to the combs to clean up the honey. When the combs were covered with bees we set them in the hive and let the bees work out the honey and carry it home. We dug a hole in the ground and buried the bees, then went home. When we came back in a couple of days to get the feeders we carried the empty combs home.

• Platteville, Wis., Nov. 28.

[It seems like a foolish thing to do, destroy property—that is, to kill the bees outright instead of letting them take their chances; but perhaps under the circumstances it was the best that could be done. It strikes me I would have scratched around hard for some other expedient. If you had advertised that you had so many colonies that you would give away providing some one would be willing to pay for the

shipping-boxes and the few combs that would be necessary to go along to give them stores, you would have found a customer. These bees, in not a few localities not many miles away, would have been worth the freight, and more too, even if they were used for no other purpose than to strengthen up weak colonies. Yes, I think you would have found some one who would have been willing to pay a little something for the bees.

You say that north of you in your State they had rains. It is not improbable that some apiaries had stores, but were short of bees. The fall that I called upon you, Dr. Miller, in the northern part of Illinois, had to feed his bees the entire season to keep them from starving. A run of about only eighty miles on the bicycle, west and north, brought me into the southern part of your State, Browntown, Wis., where Harry Lathrop holds forth. His hundred colonies had done well that season, and, at the time of my visit, were storing honey at a rapid rate from a species of wild sunflower; and yet the doctor's bees were being fed. Your own bees that season had done poorly. Now, this shows that a difference of only eighty miles makes a marked difference in the honey-flow and the condition of the bees. I venture to say that there was more than one bee-keeper who would gladly have paid the freight, and a little more, for a distance by rail of eighty or twice eighty miles for a lot of good bees to strengthen up their weak stocks.

Say—the next time you or any one else finds himself confronted with this condition, write us before destroying the bees, and we will give you a free advertisement, in which you can offer to give away bees to any one who will pay all expenses. While you are about it you had better tuck on a price of, say, 50 cents a colony, for I don't believe it would be necessary to give them away outright.

Your records for the past 15 years are very interesting, as showing what has been done by large extensive bee-keepers. You have suffered heavy winter losses at times; but it is interesting to note how, the following season, you recovered those losses by increase, to say nothing of the honey secured. With plenty of hives and empty combs, there are here great possibilities. I remember one season, at our Shane yard, all in single-walled hives, we lost some sixty colonies out of about seventy. The remaining ten or twelve, fair to good, I increased the following season to some eighty good strong colonies, and secured a good crop of honey besides.—ED.]

HOW B. TAYLOR USES HIS SMALL "HANDY" BEE-HIVE.

NOT LARGE HIVES, BUT SMALL ONES CAPABLE OF EXPANSION.

By B. Taylor.

In the *American Bee Journal* for Jan. 16. Dr. Miller says:

DADANT WITH HIS BIG HIVES.—Chas. Dadant certainly makes a strong showing in favor of plenty of room in the brood-chamber, and I'm looking with interest for some reply from the advocates of small hives. I'd like to see the two D's lock horns—he of Borodino, and the Frenchman. What about a big lot of bees reared too late to work on the harvest? Even if it be admitted that the eight-frame is too small, why, Mr. Dadant, can't we use two of them for each colony?

I have been, and am still, an advocate of a small hive; but as my position seems to be misunderstood I will again explain. The question

of large or small brood-chambers was raised early in the meeting of the North American Bee-keepers' Society at Chicago, in 1893, and I then intended to explain fully my position, and prove that Mr. Dadant and myself were not so far apart as it might seem; but sickness prevented my presence at the meetings, so I could not explain, except that I remember of saying, at the first day's meeting at which I was present, that my hives would hold either "a bushel or a barrel" at the will of the bee-keeper. I have always used a large hive, even for comb honey, at certain periods of the season. I have used a large hive for extracting, at all times, except in winter and *early spring*. My hives hold 1000 inches of brood-comb each; and when used singly, mine is a small hive. Two of them can be put together in two seconds, and then it is a large hive. Three or more can be added in the same way, to increase the hive to any size that Mr. Dadant could possibly desire. Next season I shall run part of my colonies for extracted, and will give those colonies two hives for a brood-nest. I will put a queen-excluding honey-board on this, and then use as many hives exactly like the brood-hives, and filled with extracting-combs, as are needed to store the entire crop of honey. At the end of the white-honey season I will use an escape-board under these extracting-hives, and in one night the bees will be out of them, and there will not be a single cell of brood in them to disturb one's feelings. These combs being exactly like our brood-combs, when we come to extracting we can save suitable ones for feeding. If we wish to use white honey for that purpose, and any of our colonies are found wanting at the end of the *fall* honey season, they can be slipped into the light colonies with less trouble than any way we ever fed; but we do not expect to use *white* honey for feeding. We know that well-ripened dark fall honey that we can find a market for at only a low price, if at all, will do just as well to winter bees on as the more salable white; and my especial reason for using my "Handy" hives is that I can not only get all the honey in any kind of flow, but I can easily get all the white honey for surplus, either comb or extracted.

Next fall, after the white honey is removed from the hives, I will put a cover on the two hives I have been using for a brood-nest, so the bees may fill it with dark honey for winter. If the fall flow is good, and more room is needed, I open the top hive and remove sealed combs of honey, and put empty ones in their place to be filled, so there will at all times be vacant room for storing all the nectar within reach of the bees. The combs of dark honey I got as above are the store from which I will draw supplies for feeding light colonies for wintering and for breeding up again next spring. In the fall, say early in October, I will take the double brood-

chamber apart, and into one section of it I will put abundant stores to last the colony through the winter. The bees will be brushed from the removed hive, and that will be set in the iron curing-house, where no rats or mice can reach them to spoil the combs, for in the spring I will use them again to transform my small hive into a large one, that the system I use may be repeated again.

SMALL HIVES, WHY BETTER FOR WINTERING.

All my experience has led me to believe that bees winter best in a small hive crowded full of bees, and with just enough stores so there will be no danger of their coming to want or being scrimped during confinement. I have found, by many trials, that the brood-combs are less liable to mold, and will keep sweeter, when the hive is crowded well with bees, and I believe the bees keep more uniformly warm under such conditions. And I know positively that the combs and honey in the hive that is taken away will be cleaner and purer when kept in the honey-house than it would have been had the two remained all winter with the bees in them. Next spring I can at the proper time set the two together again in a moment, and have a large brood-nest again; and I can do this easier than I can carry these big double hives (or big single hives of equal weight) into the cellar and out again; for I have found by experience, especially since age has come on, and my strength has waned, that a small hive, even of equal weight, is more easily carried and handled than a large one; and I have also found that a small hive requires less room in the cellar, and that there can be many more of them put into the same size of room, with less crowding.

I will now call the reader of this back to where I reduced my large hive, which I had been using with all the advantages claimed by the friends of large single hives during the honey season. It is now a small hive again, with all the advantages enumerated above—compact, comfortable, and healthy for the bees; easy to handle, and economical of room to the apiarist. How can you prove to a practical, intelligent bee-keeper, who has “been there,” that these small hives are not good when properly used? The combs are small, and more convenient for uncapping, than large ones. Mr. Dadant admits this by using small extracting-combs. I simply use all one-sized small combs, without losing any of the advantages of a large hive, and I gain many real advantages, and that without any increased cost in material or labor. I planned my small “Handy” hive, especially for comb honey; but I have written this article entirely in the interest of extracted; and, while I believe my present conclusions are correct, yet I know that the most of us mistake mere superstition and prejudice for knowledge. I had intended to stop experimenting; but

there are so many of the leading questions in bee-keeping that seemingly rest on no demonstrated proof that I have changed my plan, and again commence the search for demonstrations in every-day practical questions of profitable honey-production.

I have previously given my reasons for preferring a small hive for wintering and early spring breeding; but for the purpose of further search in this field I have at the present time 40 two-story hives in my cellar that have at least 50 lbs. of honey each. Now, my bees never consume more than 8 lbs. each per colony. While in winter quarters those 40 colonies will be set on the summer stands, covered warmly, and left just as they are. Another lot that are now being wintered in single hives will be given another hive each at the proper time next spring; another lot will be left in the single hive until they swarm. All will be given the most equal and careful attention throughout the season. The surplus from each class will be carefully weighed, and the comparative results ascertained. Part of these colonies of each kind will be run for comb and part for extracted. I expect to get good results from each of these classes if the season is good; but if it is another poor season, I shall expect the swarms in the single hive to far outstrip the others in white surplus honey. Now, if friend Dadant will make an equally fair trial of large and small hives in his yard next summer, important facts may be learned to a certainty.

In this article I have not tried to please Dr. Miller, for I have not “locked horns” with friend Dadant. The doctor always seems to enjoy seeing the brethren “lock horns;” but I have not attempted to discredit Mr. Dadant’s large hives, but have tried to illustrate the use of small ones; for I regard it as a poor plan to try to improve our own house by pulling down those of others, even if they are not the best.

DEPTH OF COMBS; AND IS IT ADVISABLE TO HAVE THEM BUILT SOLID TO THE BOTTOM-BAR?

At another time I may try to show the superiority of small hives for comb honey. I regard the “Handy” hives, as I make and use them, as well suited for use in the tiered up or double form; yet I could use the Root eight-frame Dovetailed hive, as now made, with satisfactory results. The chief fault is its size. Eight Langstroth frames make a large hive to use in this way for comb honey. Six frames would be nearer right, and a couple of dummies would make the change. But I prefer not to use any loose traps in my work if I can help it. The “Handy” hives are complete in themselves, without any changeable parts, and are always ready for instant use in any manipulation, without any change of parts for extracted. The Dovetailed hive would work well for both super and brood-nest for two-story use. Any hive, to be satisfactory, must be made so as to maintain

at all times not more (nor less) than a $\frac{1}{4}$ -inch bee-space between the two or more sets of frames. For the brood-nest I no longer wish the combs built solid to the bottom-bars. I am convinced that a frame hive with the combs built solid to all parts of the frames, and the frames spaced $1\frac{3}{8}$ from center to center, does not give clustering-room enough for the bees in either summer or winter. The hive is cut into many small rooms only $\frac{1}{4}$ inch in width, where the bees must cluster in small bodies, entirely cut off from their neighbors in the next room; and I know the outside clusters suffer greatly from cold as soon as frosty nights come in the fall, and some harm is done in winter and in spring; and I believe that such contracted quarters are detrimental in the honey season, and have a tendency to stimulate swarming, and to crowd the bees outside the hive in hot weather. The acknowledged superiority of box hives in many respects is in remedying the evils named.

There is another serious harm that comes to brood-combs from being built solid in the frames. There is no place on their edges for queen-cells, and the cells have to be made on the face of the combs. There will be from six to twenty such cells built every time the bees prepare to swarm; and each of these cells, when cut down after swarming, will leave a hard knot of wax, and each cell will spoil one square inch of brood-combs; and this will in a few years spoil the brood-combs (especially in small hives, where we must maintain worker comb in perfection) most seriously for extracting-combs. Where brood is not allowed, solid combs are a great convenience. In my "Handy" brood-hives, as now used, the slotted top-bar gives a free passage through the center of the hive when used double, and the combs have a half-inch space between the lower edge and bottom-bars. This gives a place for a considerable quantity of bees to cluster around the queen-cells, which with me, in a two-story hive, are sure to be located on the lower edge of the combs in the top hive, where I can reach them without opening the lower hive. I am surprised at the talk about queens not going readily into a second story. I have never experienced any trouble in that way; but my combs are shallow—the deepest being but $7\frac{1}{2}$ inches; and the large and free passage in the center of the hives, and where a quantity of bees are always present to invite the queen above, may have something to do with my success. It may be that, in a hive with deep combs, whose top might not be covered at all times with bees, the case might be different. I have used many hundreds of two-story hives with combs from $4\frac{1}{2}$ to 10 inches in depth, and all of them with fair success; and I am not certain now just what depth is best; but I am quite certain that very deep combs are not suitable for a two-sto-

ry hive, and that most bee-keepers who are and have been condemning two-story hives have never given them a trial with proper hives, nor used a system suited to get the advantages of two small hives instead of one large one, in producing surplus honey on a large scale. Experience has convinced me that man is very prone to speak and act upon nearly all questions from the standpoint of superstition and prejudice, rather than from experience and reason.

What I have said in this article in favor of small hives has the merit of at least being the result of long experience in the use of such hives as well as the large single-story hives so earnestly advocated by some leading bee-keepers; and if any new light has been cast upon the question, the writer will have gained his purpose.

Forestville, Minn., Jan. 17.

[I had said that the hive discussion was to be closed; but Mr. Taylor, not having seen this, sent the article above. It is long, but so good that I decided to use it after all. It covers many valuable points, and I am sure it will pay our readers to read it clear through.—ED.]

ONE OF THE CALIFORNIA APIARIES SHADED BY LIVE-OAKS.

G. W. LECHLER & SON'S APIARY, NEWHALL.

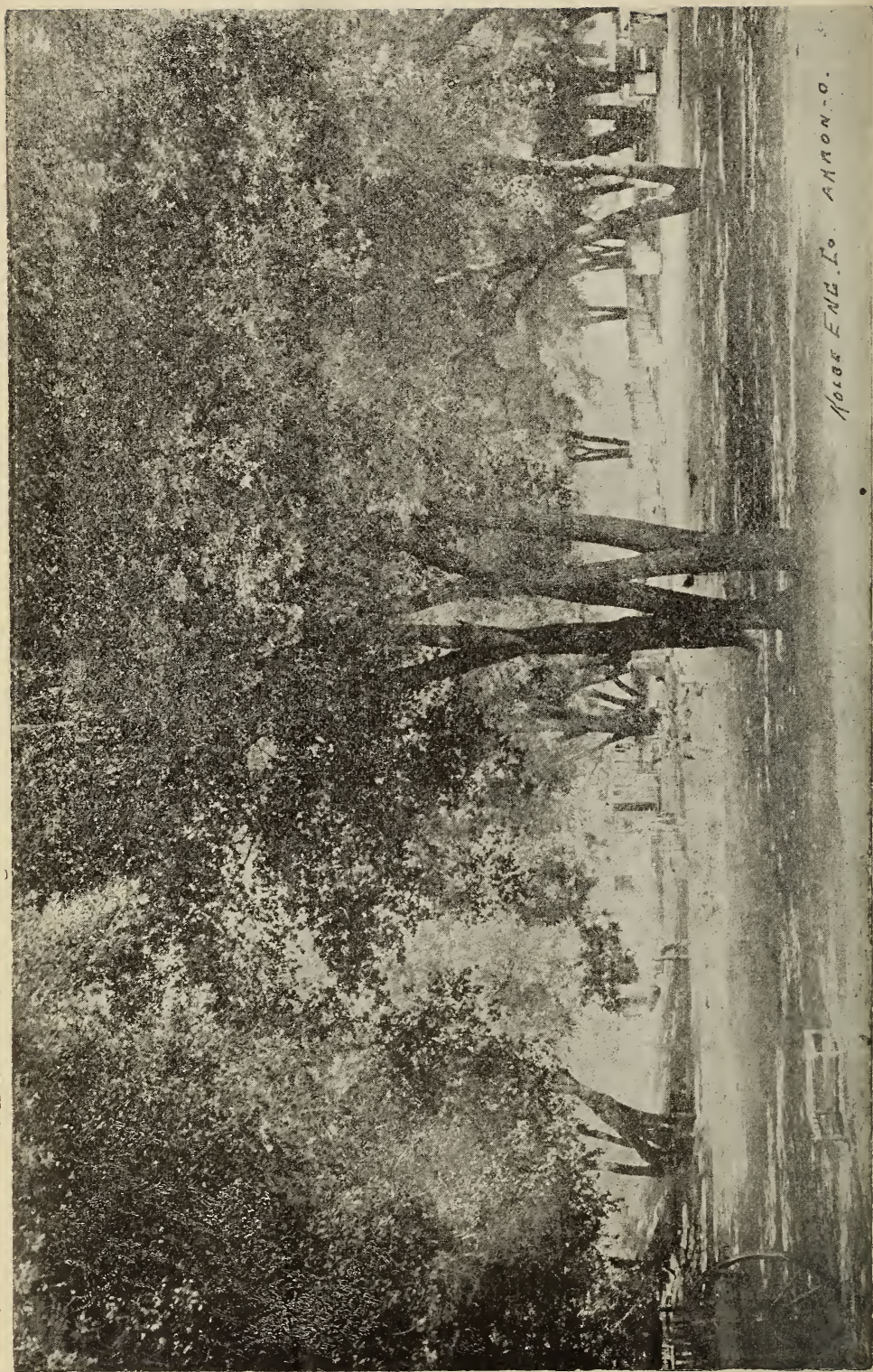
Mr. Root:—When you were at my place you requested, if I had a picture of my apiary, to send you one; and as I have had some taken I now do so.

The prospect for a honey-flow this year is very poor. I do not think we shall get an extracting. I extracted about 20 tons last season, and sold it at 4 cts. I have parties who take all our honey at a fair price. San Diego parties broke the record last season on prices.

Newhall, Cal., Mar. 25. G. W. LECHLER.

[After friend Reasoner and I had been following after his big stout colt hitched to a sulky, as I have told you about in our back volumes, up the mountain canyons, through the dried-up creeks, and even over the mountain-peaks, we suddenly came upon friend Lechler's apiary, as shown in the accompanying illustration. You know that, away back in old times, I used to discourse to you through GLEANINGS about having the apiary free of weeds, and leveled off like a brickyard. Then I said the ground in front of the hives and at the entrances should be covered with white sand, so that each hive might have a little space, at least around the doorway, so clean that, if a young queen were thrown out during the night, the apiarist could see at a glance what was up. Well, at friend Lechler's I found my ideal apiary. The artist has succeeded in reproducing the beautiful live-oak-trees, but he has not been able to catch the beautiful clean painted hives, the level ground, and the clean sandy surface all around them. We have had him try twice, but he had to give it up. There was too much shade under the trees.

Now, the funny feature of this beautiful apiary is that it is mostly nature's work. You would suppose, of course, that friend Lechler planted the trees that stand so regular they



HOLES ELL. Co. ANTONO.

A CALIFORNIA APIARY IN THE SHADE OF LIVE-OAKS, BELONGING TO G. W. LECHLER & SON, NEWHALL.

make one think of a down-east orchard. But he did nothing of the kind. In fact, I am not sure that he leveled off the ground and mowed off the weeds. You see this is a sort of desert sand, where nothing grows but these wonderful live-oaks; and they succeed in getting the moisture and fertility to such an extent that scarcely a weed can be found, let alone grass. Why, bless your heart, if you should talk about grass, or express a longing to see green fields once more, in California, they would laugh at you. In some of the large cities of that State you may find a little bit of lawn in front of some fine residence where the owner has stamps to pay for the incessant watering during the hot, dry, dusty summers. Never mind. Friend Lechler deserves credit for his nicely painted bee-hives all standing level, square, and true. Dame Nature did not build any bee-hives on the desert—not that kind, any way. Another thing, you can level up your hives nice and true in California, without any fear that Jack Frost will come along and tip them at almost every possible angle, as though he did it just for sport or in derision.

Just before we reached the Lechlers we had been climbing mountain-peaks. I wondered, in starting, why friend Reasoner took such a great big young horse to pull a little light sulky with only two men. But before we got quite over the mountains it was all the pony could do to pull your humble servant alone; and friend R. had quite a little puffing to do to get along on foot. Well, it is just like California, to show you such a beautiful natural grove in a little bit of valley, after you have been climbing mountain-peaks and naked, jagged rocks.

Friend Lechler evidently considers 4 cents for his honey a fair price; but I am afraid he will have to explain just what he means by San Diego breaking the record—at least, before we all understand it.—A. I. R.]

THE QUESTION OF BEES TRANSPORTING EGGS.

A REPLY TO DR. MILLER AND THE EDITOR.

By Friedmann Greiner.

Dr. C. C. Miller:—You speak on page 167 as though an egg in a cell is changed every 24 hours. I am not aware that any one has really made these observations. It is *found* changed slightly, very true. This I have seen with my own eyes, and I could not very well contradict the assertion—at least, not in as far as it relates to the angle the egg occupies in its relation to the cell-bottom; but that even these slight changes should occur at regular 24-hour intervals, I think remains to be proven.

Splitting hairs! Oh, yes! of course, I admit; and I also imagine detecting something of the sort on page 167. From the reading on page 143, it appears very clearly that my expression, “moving eggs,” was used as an equivalent for “transferring eggs from one cell to another to be hatched and grown there.” I seem to be misunderstood all around. Ernest leads out the old chestnut again, as though his seeing “a bee carrying an egg once” was proving any thing whatever, either for or against the egg-moving theory.

O Ernest! si tacuisses—well, I will not say

the rest. Ernest is not favorably inclined toward Latin phrases. But then, we will try to make closer observations in the future, and record them carefully. I hope many of the vexed questions may be cleared up soon. That you may be able to report next fall, “75 to 100 lbs. per colony,” is my wish.

Naples, N. Y., March 4.

Feb. 28.—Our bees on summer stands (in chaff) had a glorious time to-day—the first since Dec. 24. I think we shall come out in good shape. Bees in cellar are quiet.

[I may not be as well up on Latin as some; but I have spent six of the best years of my school and college life on that language, and I know of no reason why I should not be “favorably inclined toward Latin phrases.” If I had kept silent on this, as the quotation implies, some of our readers, at least, would not have known that there was any proof to the effect that bees do carry eggs. I did not say (referring to page 143) that I had seen a “bee carry an egg once.” The fact is, I have seen them do it repeatedly. I grant that this seeing, in itself, is not absolute proof; but taken in connection with the references that I cited from our back volumes, it is very significant. Our senior editor, when I brought the matter before him, was greatly surprised that any one should doubt the point; for when he had charge of the apicultural matter in the journal, ten years ago and more, the question as to whether bees carry eggs from one part of the hive to another seemed to be pretty well established and accepted. Indeed, on p. 323 for 1883 he says, in a footnote, “We have good evidence that bees carry eggs from one comb to another.” It would take hours to look up all these references, and, moreover, it is not necessary; but instances are on record where, in a hive hopelessly queenless, was placed a comb containing partially completed queen-cells, and another comb containing eggs. In twenty-four hours or so eggs were found in the cells of the other comb, and subsequently these hatched good queens. And, again, if I remember correctly, I have placed a comb of eggs in a hive that I knew to be queenless, and the next day found a few scattering eggs in the combs next to it. You say you were misunderstood; that your expression, “moving eggs,” was “used as an equivalent for transferring eggs from one cell to another.” On page 143 you say, “Many careful and keen observing men and women have kept and are keeping bees, and still such a thing as transferring eggs has not before been observed. To me it does not look possible,” etc. This is my excuse for reproducing the “old chestnut.”

[*Later.*—After I had written the foregoing I came across the following, quite by accident. It was among a lot of manuscripts which, for want of room, were deferred till later. As it strikes upon the point at issue, I give it here.—Ed.]

HOW BEES TRANSFER YOUNG LARVÆ FROM ONE FRAME TO ANOTHER.

For some time past I had been noticing that one colony that, in former years, was especially marked in honey production, did not seem to be in its normal condition. There seemed to be but little apparent activity in the hive. August 10th I opened the hive and made an investigation. I found my suspicions confirmed; namely, that the colony was queenless. The

combs were well filled with honey, and a fair number of bees were in the hive; but not a trace of brood at any stage could be seen. On the evening of the same day I sent off an order for a gray Carniolan queen, as I was anxious to try that strain. On the 14th I gave that colony a frame of brood, some of which was sealed, and others in all stages. I know but little about the best method of management of bees, but I wanted to see what effect the introduction of brood into the hive would have upon the bees. I thought possibly it might make them anxious for a queen, and that thus they would more readily welcome the new queen when she would come.

On the next day, the 15th, my queen came. Before placing the cage in the hive I examined the frame of brood to see whether they had begun to construct queen-cells; but there was no indication whatever in that direction. As the bees did not seem to be anxious to release the queen I examined that one frame every day, but no trace of a queen-cell was seen.

On the 19th, four days after the introduction of the queen-cage, I concluded to make a more thorough investigation. This time I examined all the frames, and I found a number of queen-cells throughout the hive—some on the third frame from the frame of brood. The bees had transferred larvæ into the queen-cells, and one queen-cell was capped, and one cell had a larva just hatched. They had also transferred considerable brood into worker-cells and into drone-cells. Some of the drone brood and worker brood was capped. The drone-cells were in the third frame from the introduced frame. On some of the frames I found about ten square inches, every contiguous cell filled with brood. The bees had evidently a hard job on their hands. Some of the brood was not in natural position in the cell; but, instead of lying parallel to the surface of the comb, much of the larvæ had one side deeper in the cell than the other side. Again, the bees were not able to place the larvæ in the bottom of the cell, but nearly all were lodged about half way down.

I am now convinced that bees do transfer brood in different stages of development. They transfer it to quite a distance; and, while in this case the tendency seems to have been to group the transferred larvæ, yet on some of the frames a single cell containing brood was found.

From the noted condition of the hive, and from some facts that I know about the colony, I think the queen was lost in May.

DANIEL FLEISHER.

[Perhaps my friend Greiner will insist that this is not a case in point, because he was talking about *eggs*. If bees will transfer larvæ they will eggs; and, to refer to that "old chestnut" again, I have seen the bees carry eggs. If they carry eggs they can also put them in cells. —ED.]

Look here, friend Greiner, you think you're misunderstood all around; but it seems to me

I'm the one that's misunderstood, if you think I wanted to treat lightly what you said on page 142; for I consider it a matter of no small consequence to know whether eggs can be kept in safety for some time out of the hive, and have done some little experimenting in that line, although none of my efforts have so far been successful. It surely would be a nice thing if we knew how to keep eggs out of a hive for even three or four days, and then have the bees hatch them out; for in that case there could be quite a business sending eggs by mail.

I'm rather ashamed to say it never occurred to me before that it made any difference how fresh or how old an egg was, so long as it had been kept by the bees and had not yet hatched out into a grub. But since you mention it, it looks very reasonable to suppose that, as soon as the hatching process has commenced, the egg begins to change, and will not endure removal from the heat of the bees. After a hen has been sitting on an egg three days I suppose it will be spoiled if chilled, although before the hen commences to sit on it it may be almost frozen without impairing its vitality. Reasoning by analogy, if we understand that the process of incubation commences immediately when the queen lays the egg, it will be as far advanced when ten hours old as the egg of the hen after it has been sat upon three days. So if the queen is laying regularly, and we want to take out eggs that are fresh enough to keep, we'll find only about one out of every eight eggs in the hive of that description.

Now about bees moving eggs. I think you are right in believing that nothing is proved one way or another as to whether bees can move eggs from one cell to another, and then hatch them out, simply by the fact that a worker has been seen carrying an egg in its mouth. It might be carrying it the same as it would carry a piece of dirt.

But if the teaching of others is correct, you are wrong in thinking that the egg is so firmly cemented to the bottom of the cell that a worker can not move it, and also in thinking that, in all stages, the bees would have to fasten the egg in the cell "standing on end." I do not know from my own observation that "an egg in a cell is changed every 24 hours," but I think I have seen that distinctly stated by more than one writer, albeit by no one this side the ocean. I quote what is said by no less an authority than Thos. Wm. Cowan. In the "Honey Bee," page 10, he says, "It will be noticed that the egg stands in a position parallel to the sides of the cell, and this position it retains the first day. On the second day it is inclined at an angle of about 45°, and on the third day it assumes a horizontal position, resting perfectly flat on the base of the cell." It seems a little strange that American books make no mention of this, as it is a matter that can very easily be proved or disproved.

At any rate, so far the statement stands on good, unchallenged authority; and so far as it has any bearing upon the question of bees moving eggs from one cell to another, it at least favors the idea that they do something in the way of handling eggs. But I've no kind of idea whether bees do or do not move an egg from one cell to another.

C. C. MILLER.

Marengo, Ill.

SOME HOME HINTS THAT ARE RIGHT TO THE POINT.

By Mrs. L. C. Artell.

Mothers, brush back your hair neatly before breakfast, and thus set an example for your daughters.

Fathers and brothers, please clean your feet before you come into the house, and help mother to teach the younger children to do the same, and thus save much labor for the over-worked wife and mother.

Brothers and sisters, say "please" to each other when you ask a favor, and "thank you" for favors done, and thus scatter sunbeams of love and cheerfulness in the family circle.

Let no member of the family excuse himself for being cross and wearing frowns. It makes everybody feel uncomfortable who comes in contact with you, and life is too short to plant thorns where flowers and fruit ought to grow.

As often as the children have dirty faces, send them to wash them, even if it is a dozen times a day, and they will soon learn to keep them clean of themselves.

Give poor pussy a little new milk regularly, and she will thank you by catching more mice, and milk will keep her well if she eats too many rats.

In teaching the little ones to wipe dishes dry, wet the dish-towel in clean hot water and wring very dry. It takes up the moisture from the dish more readily, and the little one will not complain she can not get the dishes dry.

When potatoes are pared over night to cook for breakfast, do not let them stand on the stovehearth or reservoir where they will get warm, for that will make them soggy, and hard to cook.

Don't try to use dull scissors or shears. It doesn't pay. If husband or brother can't sharpen them, buy a scissors-sharpener and learn to do it yourself.

If you have found out something new, and you would like others to share it with you, drop your work immediately and note it down, or you probably will forget to do so in your leisure.

Rub up the lantern. I have often seen nicely dressed people carry around very dirty lanterns. They never think of cleaning. Clean not only the glass but the whole lantern.

In washing clothes when kerosene is used,

always put in enough soap to make a good suds. One tablespoonful of kerosene to a patent pail of water is sufficient.

Save the apple-parings and throw them into a jar of soft water—boiled well water will do. When the jar is full, press out the parings and sweeten the cider a little, and throw in more parings from time to time, and you will soon have nice strong cider vinegar. It will come sooner, and be stronger, if you can give it a mother from other vinegar.

If it is winter, don't forget to have your little strawberry-patch covered lightly with straw or strawy manure. It doesn't pay to keep your strawberries cultivated properly during summer, and then neglect to cover them in winter.

Don't wait to do all your house-cleaning at one time, every fall and every spring, as people usually do, and thus make the whole family uncomfortable for several days, but clean a room from time to time the whole year round, and thus keep the house clean and sweet.

Call upon your neighbors whether you think you have time or not, and thus promote a kindly feeling between them and yourself; but be careful of what you say of others; cultivate the habit of saying nothing you would not say to their face.

"Show me the books and papers the family read, and I will tell you what kind of people the family are," is a true saying; therefore provide good reading for both old and young. If you are tempted to feel you can't afford it, let the family live on two meals a day until you have saved enough, and see if you don't feel, before the year is out, your third meal has been the best of all.

Each day after sweeping painted or hardwood floors, wipe them over with a mop wrung out in clean water, and thus keep your working-rooms clean and healthy.

Do not let a tin boiler stand with water in it, as it rusts it very soon, and will rust the clothes, and will soon leak; but as soon as the washing is done, wash out and dry, and rub the inside with a greased rag that is kept for that purpose, and put the boiler away in a dry room, not in a cellar, and it will last four times as long as if not properly dried and greased.

Old tin pans that are rusty are unfit for milk or food of any kind, as tin rust is poisonous, though it pays to take care of the old pans. They may be used in many ways that will save the new pans.

White specks in butter are often caused by the cream becoming dried before being churned, the milk being set where the wind blew upon it. When churned it could not be dissolved. Some would still be seen floating in the butter-milk.

Roseville, Ill.

[There, dear friends. I hope you will read the above all through twice, just as I have done. When you read it the second time, carefully

ponder and consider whether it does not hit you somewhere; and when you get through I shouldn't wonder if it would be a good idea to write our friend a postal; and if you have not time to put any thing more on it, just write "Thank you for the home hints."—A. I. R.]

A CRITICISM ON GLEANINGS,

ON THE HOME OF THE HONEY-BEES, ON THE
A B C OF BEE CULTURE, AND ON THE
ROOT OF ALL.

By J. W. Porter.

For many years I have been a fairly careful reader of GLEANINGS, and such an admirer of The A B C of Bee Culture that I have, to no small extent, lionized its author. During the last two years, however, I have read GLEANINGS, as well as other literature from the Home of the Honey-bee, with more critical attention than I formerly did; more particularly so, as to the phraseology, typography, and style of the reading-matter sent out from that institution. In doing so I have, very naturally, formed opinions as to the morals, nature, merit, ability, and motives of persons connected with that establishment, as well as correspondents and advertisers in GLEANINGS, where their acts and sayings came near enough to the surface to allow me to form an idea as to their individual characteristics.

Readers of GLEANINGS will remember that, on several occasions, that journal has invited criticism from its readers, and yet I remember that no extended criticism has been published.

Mention has been made, probably by the associate editor, that the intention was to make GLEANINGS compare favorably with the best periodicals of the day. I take it for granted that he meant that the comparison should relate almost wholly to the typography of GLEANINGS. I should like to see such intention carried out, for I see abundant evidence of the ability of the publishers of GLEANINGS to warrant success in that undertaking. But to make the necessary changes to bring GLEANINGS up to that standard means quite an additional expense; and can the editors afford to make the change? The readers will be better able to judge of this after reading the following:

The *Century* is published twelve times per year, and is sold at the news-stands at 35 cts. a number. The twelve numbers contain about 3,500,000 words. GLEANINGS is published twenty-four times per year, and contains about 2,016,000 words, and is furnished to subscribers, with postage prepaid, at about 4½ cts. per number. The *Century* has a circulation of more than 200,000; GLEANINGS has a circulation, say, of 12,000 to 14,000, and uses over a ton and a half of paper every month. It appears, then, that GLEANINGS has to put up fully \$300 every month for paper, postage, and freight. Let every delinquent subscriber to GLEANINGS fol-

low out the bill of expenses in publishing it, the cost of skilled labor, the use of costly machinery and type, then add to this the yearly loss of \$3000 on unpaid subscriptions; and when the estimate is made, conscience will prompt them to pay up for past favors.

The majority of mankind do, to a certain extent, form an opinion of their fellow-creatures by their dress and personal appearance; so also does the reading public form opinion of books and magazines by their dress and general make-up. Commencing a review of GLEANINGS in accordance with that primitive method I shall have to speak first of its outside dress.

The cover of that journal has now a modest and very fashionable color, but it is not a good color for print nor for cuts where black ink is used. The design for the front cover has considerable expression, but it can not be classed with first-class designs. I should say the floral display is too "loud," and that there are too many bees in flight; yet it is an improvement over the former cover. No doubt a good deal of pains was exercised in the selection of the present design, and it is certainly modest and tasty, taken as a whole. The design cost considerable, and was not a thing of chance. When GLEANINGS takes the next step in improvement I hope it will embrace the whole makeup of that journal. And for the next cover, I would suggest some design without a very pronounced floral display, and without any bees in flight—perhaps queen-bees at rest on the four corners of the border lines, and the cover, say, of pale-blue tint, the ink for both the outside of the covers to be very dark blue and light red, the design for the first page of the cover to be selected from as many designs as would be offered in a prize contest for the best design.

The advertising pages of GLEANINGS look fairly well during the winter months; but during the summer months, when Tom, Dick, and Harry begin to advertise their wares with stereotypes of their own designing, these pages begin to take on a ragged appearance, not at all conducive to patronage from firms and individuals who make advertising a business and a study. When GLEANINGS shall conclude to control its advertising department in respect to the style of the advertisements, it will at first create a little trouble with some of those now advertising; but in the end it will be advantageous to all parties concerned. Display type used in show-bills and gutter-snipes look very well in a newspaper, but are seldom used by first-class journals in advertising. Turning now from the advertising department, and passing on to the core, or reading-matter, of GLEANINGS, I will first speak of the type used.

If I should place *The Cosmopolitan*, *The Arena*, and *The Century* in the hands of almost any one of the many readers of GLEANINGS, and tell him to compare the typography of

those journals with that of GLEANINGS, and explain what causes the difference in appearance, he would be very likely to say, "The difference is in the size of the type. GLEANINGS uses a great deal smaller type than do those others." But should the reader attempt to prove this assertion by actual measurement, unless he was of a very mechanical turn of mind, he would then declare that he was mistaken; that there is no difference. But when carefully measured by a finely marked ruler, a difference in size can be seen. The lower-case type of GLEANINGS measures $\frac{1}{10}$ of an inch, *The Century* $\frac{1}{14}$, and *The Arena* $\frac{1}{15}$. *The Cosmopolitan* uses about the same size of type that GLEANINGS does. Measured the other way, GLEANINGS can print 18 letters to the running inch, *Cosmopolitan* 17, *Century* 16, *Arena*, 15, not allowing room for spacing. This is getting down to hair-line measurement, and the difference in the size of these type seems almost too small to be noticed. Any one, after seeing that there is so little difference in the size of the type used by those four journals, would naturally jump to the conclusion that there must be a great deal of difference in the "leading" of the reading-matter; but, again, the measurement most emphatically disproves that assertion; for, on measurement, the difference in the space between the lines is only about $\frac{1}{100}$ of an inch. Then the third and most correct conclusion is reached; to wit, a very little difference in the size of the type, and a very little difference in the leading, and a very trifling difference in respect to the broadness of the face of the type, is readily noted by the eye.

But while there is so little difference found in the size of the type used by the four journals in question, there is, as before stated, a vast difference in the appearance of the printed pages of the said journals, and this difference is most quickly discovered by the weary or the aged eye.

Only one defaced letter in a whole page may be passed by the reader unnoticed; but where there are many defective prints in a page, the eye will quickly discover the inharmony, though the reader may not immediately comprehend the cause. To further illustrate this, I will here refer to page 21 of GLEANINGS for January, 1894. To me that page did not look right, though I was reading for information, and not for the purpose of criticising. In looking for the cause I counted fifty defective prints on the page, and I probably did not discover all the imperfect prints at that.

It is fair to presume that at least a third of the readers of GLEANINGS are people past the noontide of life, and that they use glasses in reading; and if this is true, Mr. A. I. Root should, in justice to his readers, not only "lead" his special department in GLEANINGS, but should also employ larger type if he can af-

ford to do so. He, however, is a man of very decided ways, and at times firm almost to unpleasantness; therefore, rather than be unhorsed from his hobby, which in this case is very small type, he would be very likely to appeal to his readers about in this way:

"Now, my friends, you have read my unleaded articles in small type for a good many years; what say you? Do you want a change to larger type and leaded matter?" And to the question so put, especially if it came up in the way of criticism, in all probability the answer from a large majority of his readers would be, "No change; the present style is good enough for us." On the other hand, should he first put his special department in larger type and lead it out, and then say, "My friends, I have given you my talk this week in a larger type; what say you? Do you like it better than the smaller type?" I feel certain that none of his readers would be backward about expressing their approval.

I do not claim that good taste is violated by solid (unleaded) matter in Mr. Root's special department; and, so far as I know, he might use pearl type and not violate any rule known to publishers. But as he writes these articles with the expectation that they will be read, he certainly should manifest some concern as to whether they can be easily read or not. Allow me to draw a picture from every-day life.

Mr. A. is a farmer and bee-keeper. The day's work is done, and he is physically tired. He takes GLEANINGS, and reads, as is his custom, from first to last page. Somehow or other the print blurs a little, and he cleans his glasses and continues his reading, but with considerable discomfort to his eyes. It happens to be on one of those occasions when eyesight appears to be a trifle out of order, and he does not enjoy his journal quite as well as he had anticipated. He finally concludes that he is too tired to read the journal through, and that he will just turn to Bro. Root's special department and compose his mind for sleep. But the letters blur worse than they did when he first commenced to read; but he struggles through half a column of ethics, and then lays the book down with a feeling that he will either have to give up his reading at night or get a new pair of glasses. Thus Bro. Root's article is never finished by Mr. A.

Allow me to further illustrate: The reading-matter of GLEANINGS is crowded into eight lines to the inch; A. I. Root's special department, eleven lines to the inch; and the A. I. Root Co.'s advertisement of wire netting, on the inside of the back cover, is 12 lines to the inch, and on colored paper. It is true, that most rapid readers read from the form of words, and not by spelling them; yet, to so read, the letters must be far enough apart to be distinguishable from each other, and the space between lines

wide enough so they shall not seem to run together. But reading by form can not be applied to matter containing figures, such as are found in the advertisement referred to.

Besides the editors and their work, there are others connected with the publishing department of the A. I. Root Co. who are very important factors in all publications turned out by that company. I refer to the foreman and his staff of compositors. In their province, good judgment and good taste have to be continually exercised. I judge from the work turned out by that establishment that there is a master hand at the helm, and one that can do good work with very commonplace material. Then, too, a publisher is often a better judge of literary work than the editor; therefore there must be times when articles are handed to the foreman for publication that would cause him to "sweat blood."

Ponca, Neb.

(To be continued.)



BUILDING WORKER COMB.

Question.—How can I secure worker comb in frames without giving frames filled with foundation? In taking out combs and inserting frames having only a starter, I find the bees invariably build drone comb. I also find that swarms hived on frames having starters on them often fill whole frames with drone comb. Please tell us in GLEANINGS how we can secure extra frames of worker comb without using foundation.

Answer.—In this question we have one of the puzzling things which confront us in bee-keeping, and one which every bee-keeper is sure to run against, even though he inserts only a few frames in a hive which are not filled full of foundation. I have found, from twenty-five years of experience, that it is folly to insert a frame, having only a starter in it, into a full colony previous to the swarming of that colony, with the hope of getting one square inch of worker comb; and if frames must be inserted in such colonies, at such times, it will pay the apiarist to purchase comb foundation for such frames, even though he has to pay as high as a dollar a pound for it, rather than try to get them filled with worker comb by the bees.

But if we have extra combs on hand to put in the place of those taken out then we are all right, and even better off than to put in foundation, had we a storehouse full of the same. So we come to the main question: "How shall we secure *extra* frames of worker comb without

using foundation?" I find that there are three conditions of the hive or colony, under which, if rightly managed, the bees will almost invariably build worker comb. The first, and surest of the three, is when a colony is very weak, or what we term a nucleus. If such a weak colony is deprived of all of its combs save one of honey and one of brood, and a frame with a starter in it is inserted between the two combs left in the hive, the bees will, 99 times out of 100, fill that frame with worker comb, said comb being as perfect as one built from foundation under the most favorable circumstances. Now, in all cases of uniting bees in June, that two moderately weak colonies may make one strong one for the production of comb honey, I am always on the lookout for these extra combs, for this is just the time to have them built. In fact, whenever I have any weak colonies in June or July, or whenever I have any very strong nuclei in my queen-rearing, I always have an eye to this matter; and in this way I secure many extra combs of the most perfect kind, to be used in years to come.

The second is at the time of hiving new swarms, which are treated in this way, when I wish them to build worker combs. The swarm is hived on the full number of frames the hive contains, and left for 36 to 48 hours, the surplus-apartment generally being put on when the swarm is hived. The hive is now opened, and five of the frames are allowed to remain—those which have perfect worker combs started in them, the rest being taken away, and dummies used to take the place of them. This throws the force of bees, not needed below, into the sections, and gives a place in the sections for storing all of the honey brought in from the fields, so that the bees do not need to build any store comb in the brood-nest, which store comb, when built for that purpose, is generally of the drone size. By this time the queen is ready to keep up with the bees in their comb-building, with her eggs, and thus nine times out of ten I get these five frames filled with worker comb, and, besides, secure a good yield of section honey. This is very similar to the way W. Z. Hutchinson works to secure a good yield of section honey and frames filled with worker comb, and, if I am not mistaken, he agrees with me that combs so built are a clear gain to the apiarist. When any colony having an old or laying queen is first hived, some of the combs started are liable to be of the drone size, on account of the queen's not being in a condition to fill the cells at first, as all queens cease almost entirely to lay for 24 hours previous to swarming, so that they may be reduced in weight that they may fly and accompany the swarm; and full prolificness does not return under 48 hours after the swarm has commenced keeping house in its new home. As these combs having drone size of cells are just right for store combs,

the bees generally keep right on with that size of cells till the bottom of the hive is reached.

There is occasionally a swarm that seems determined to rear drones, and in this case they will build some drone comb, no matter if they have all the room for storage necessary, in the sections. Where, from appearances, I think drones are desired, I insert an old drone comb at one side of the hive, besides the five frames that are started with worker comb, and this satisfies their desire for drones, and I succeed in what I am after—the five frames of worker comb. This drone comb is taken away at the end of ten days, or left, as suits me best. As soon as these five frames are filled with worker comb, I now fill out the hive with extra worker combs or frames filled with foundation, as I may elect, when I have that hive filled with worker comb for the next 20 years to come, unless something happens to destroy a part or all of it, or I take it away to use elsewhere.

The third condition under which worker comb will be built is just after the young queen gets to laying in any colony having cast a swarm. If, after she has been laying a day or two, we take away two or three combs and put frames with starters in their places, we shall find that said frames will be mainly filled with worker comb; but we are not quite as certain of it in this case as we are in either of the other two, for it sometimes happens that the bees will prefer to leave off storing in the sections, and build store comb in the frames, thus defeating what we are striving to attain. The bees are also more likely to build worker comb on a fall yield of honey than they are in the spring; but I have never had any thing really satisfactory along this line, save under the three conditions which I have given, and have spoken of them in the order of their worth, as I consider it.

DADANT HIVES.

Question.—Can you give me the measurements of the Dadant hive so I can make them with hand-tools?

Answer.—I do not think I am familiar enough with the Dadant hive to do this, and would advise our questioner to send to the publishers of *GLEANINGS* for "Langstroth on the Honey-bee, Revised by Dadant," in which he can find, on page 163, cuts, etc., which will enable him to make the Dadant hive, I think, but which would be asking too much of this department to insert here. I should have answered this privately had the questioner given his name.

ONLY ONE COLONY LOST IN SIXTY.

I have lost only one stand in 60. It was a so-called Perfection hive that an agent left with me on trial. As he paid me \$3.50 for the bees to try it with, it's his funeral.

J L. MCKENZIE.

Howesville, W. Va., Apr. 4.



T. L., Iowa.—Bees show a strong liking for salt water. We sometimes salt the water for them. They evidently require it or else they would not seek it.

H. D. K., Ohio.—The custom on the part of bee-keepers who requeen often is to do it not oftener than once in two years. Once every year, as you suggest, would be an unnecessary expense.

W. G., Pa.—It is not safe to try to commence queen-rearing before about June first. As to the best method of getting cells started, it varies with different ones. For our plan we would refer you to the A B C of Bee Culture.

J. C. S., Wis.—Sorghum molasses will do very nicely for spring feeding. We would not recommend it, however, for a winter food, although it has been used in a good many cases, and has given good results. If you have to buy the food to give the bees for spring stimulating, we would advise you to buy granulated sugar. It costs a little more per pound, but it goes further; and in the end, we think, it is a good deal cheaper.

J. J. D., Cal.—An acoustic telephone is sometimes used to indicate when a swarm has come forth. Wires are strung on poles clear around the apiary, and then connected with the house. The striking of the bees in rapid succession against the wire when a swarm comes forth will promptly give you the alarm. Sometimes, when they are working heavily in the fields, the frequent tapping of the wire will lead one to suspect a swarm; but when a swarm comes forth there is a perfect onslaught of taps. An electric telephone, of course, would not answer the purpose at all.

G. A. F., Minn.—In keeping bees on shares it is usual for one of the parties to furnish the bees and the other the labor. Any hives or other material that has to be bought for the apiary is usually shared by both the parties equally. At the end of the season the honey is divided if they get any. We usually advise against keeping bees on shares, as a good many disagreements have arisen. A far better way is to buy the bees outright yourself, if you can, and then pocket all the proceeds and all the losses too; and if things do not go right you have only yourself to blame.

R. E. H., Ky.—In the matter of queens just hatched, it is *usual* to let them have their own way. The young queens will remain in the hive if they do not attempt to swarm out, and in proper time one will become fertilized and the rest disposed of. Generally they do not become hatched until the parent colony has swarmed out, including the old queen. Then,

of course, the bees that remain simply wait for the young queen to hatch and become fertilized and begin to lay. If there is a plurality of them, there will likely be a small swarming-out with each.

C. M. T., Ill.—The honey referred to in this journal, that was raised to a temperature of 180 degrees, was not made darker; but when honey is brought to a *boiling-point*, and kept there, it will turn darker, and its flavor will be injured. It is possible that some honeys would be affected by a temperature of even 180 degrees. That of which I spoke was from white clover. In any event you must observe the precaution of bringing it up to 180 degrees and then take it off the stove immediately, and seal while hot. An ordinary thermometer would do to register the temperature. Those sold for dairy purposes would be better, of course.

E. S. S., Ind.—Replying to your question No. 1, I would say that, by feeding, you can make your bees considerably stronger. We would recommend the Boardman feeder, as given on page 27 of our catalog. The bees should be fed along nearly up to the time the honey is coming in, and then, of course, feeding should stop. 2. You can begin feeding almost any time now. 3. Yes, we would feed even the colonies already well supplied with stores. By sending to H. R. Boardman you will get some good reasons why colonies well supplied should be fed. 4. It is generally advisable to feed either at the entrance of the hive or inside of it. There are certain cases when bees can be fed out of doors; but the trouble is, some colonies will get more than their share, and usually it is the stronger colonies that get the most. In such outdoor feeding it is generally safer to use very thin sugar syrup, or inferior sweet of some kind, the same as is spoken of in the A B C book you have. Yes, you can feed the bees meal to stimulate brood-rearing, as is explained in the A B C of Bee Culture; but it is not absolutely necessary, and of late years we have not practiced it at all, because natural pollen comes in as soon as the bees really need it.



ADULTERATION NOT PRACTICED IN CALIFORNIA.

California can not afford to mix honey with any thing, but I think a large amount of our honey is mixed after it goes east. They have put up a great cry that we mix our honey, just to shield themselves. The reason I make this statement is, our honey-buyers here often get letters from Chicago and Kansas City like this: "A man here needs a car of honey for flavoring;" or, "A manufacturer needs a car;" or,

"A syrup man wants a car for mixing." I want to know what they call it after it is mixed. It is apt to be "Pure California Honey." Then they cry at us, "Thief! thief!" so all will run after us and hiss, while the real thief goes free. Selma, Cal. O. W. STEARNS.

OUR EXPERIENCE WITH SWEET CLOVER, ALFALFA, KAFFIR CORN, ETC.

The bees work on sweet clover well. The first we fed to our stock was cut quite small, and the horses or cows did not eat any of it for about a day; but when they tasted it they preferred it to any thing else. It is the same way with red or alsike clover. When our stock are used to eating prairie hay they will not eat clover until they have had a little time to become accustomed to it.

We have raised the Kaffir corn for several years, and think it good. The seed is excellent, especially for chickens; but for fodder, the sugar cane is a little better. Both stand dry weather well. The great advantage they have in a dry season over maize is that, after a long dry spell, they will take a second shoot and do well, which the corn will not do if it is too far advanced when rain does come. I have grown alfalfa and alsike clover side by side, and we could hardly see a bee on the alfalfa; but after my alsike died out in the winter of 1892 the bees worked some on alfalfa; but when our seasons become more moist, which will enable us to grow alsike, I would not exchange one acre of it for five of alfalfa for bees.

Our weather is fine, and prospects are good. Our bees gathered plenty of stores and some surplus last season. J. T. VAN PETTEN.

Linn, Kan., April 15.

[The great advantage of alfalfa for honey is in the fact that it is grown in many places by the hundreds and thousands of acres. Where irrigation is practiced, it seems to be a sure thing season after season. Now, there is no place in the world where alsike clover is grown in this way or on this large scale—at least, I do not know of any such place. Again, alsike blossoms only once in a season, while alfalfa, if I am right about it, blossoms three or four times, so that, in a locality where it is raised on a large scale, there is pasture for bees somewhere on the alfalfa during almost the whole season. I think you are right, however, in thinking that alsike gives a larger amount per acre, usually, than alfalfa.—A. I. R.]

SWEET CLOVER IN KANSAS.

I have grown sweet clover for four years. I first got 4 lbs. from James Vick, but the chickens destroyed most of it; but I saved some seed. Last year I raised about $1\frac{1}{2}$ acres of seed which turned out well. It would average about $4\frac{1}{2}$ to 5 ft. high. When it was just in its prime I had a boy cultivating corn and trying to fish at the same time—two jobs that never would work together right. However, the horses got frightened and ran away. They made good time till they got to the sweet-clover patch, which they

had to cross, but that was too much for them. The dense growth of clover threw both horses down and stopped them, breaking the tongue out of the sulky cultivator. If the clover had not been there I think they would have run right into the barbed-wire fence and perhaps ruined one or both horses. I don't think that any two-horse team with a vehicle could run through the length of that clover-patch.

I sow early in the spring, about 10 lbs. of seed to the acre, with oats; but I think it is better alone. I am saving about two bushels of seed to sow in the corn at the last cultivating. I tried about four acres about the last of August, 1895, but it did not come up. Horses like it first rate when they get used to it. Bees won't work on any thing else while the sweet clover is in blossom.

JOSEPH SHAW.

Strong City, Kan., March 23.

Farmers are beginning to find out that sweet clover is a valuable plant besides being a good honey-plant.

C. H. DIBBERN & SON.

Milan, Ill., Mar. 22.

CROSS-FERTILIZATION OF FRUIT-BLOSSOMS BY BEES.

As to the honey-bees as an aid to fertilization, we fruit-growers of Burlington Co., N. J., encourage the rearing of the honey-bee for purposes of fertilization. We find that some varieties of pears will not bear at all unless cross-fertilized by the bees with other varieties of pears; also, that all variety of fruits and berries are greatly benefited by the same process of fertilizing; and it has been clearly proven with us that, the more honey-bees, the more and better fruit and berries we have; and, as the gentleman in England mentioned in GLEANINGS, Feb. 15, we now want the honey-bee with us. They work for us for nothing, and board themselves.

LEWIS WILLIAMS.

Parry, New Jersey.

DOUBLE-WALLED HIVES MORE ROBBER-PROOF THAN SINGLE-WALLED.

Is it not true that a chaff hive is a partial safeguard against robbing? I commenced bee-keeping some twenty years ago with black bees, in American single-walled hives. Robber bees, from a distance, were so annoying and so persistent in their attacks that sometimes my best colonies would succumb. I was disheartened, and sold my stock. Not being satisfied without bees, I commenced again, with Italians and chaff hives, walls five inches thick, and have but little trouble with robbing since. I have attributed it largely to the change of hives. The stores, being farther away, are not quite so tempting; and the gauntlet to run (five inches instead of one) is not so promising. You may say it is the bees; but there being blacks near by, I can not keep mine pure. Some of them get black; still, they are proof against robbers.

I prefer not to have them warmed up and tempted out the first spring sunshine, to be chilled and lost, but would rather keep them indoors until the air is warm enough to let them fly and return, without freeze or chill, and thus measurably prevent spring dwindling. Double hives or none for me.

J. D. GILL.

Philipsburg, Pa., Mar. 24.

DOUBLE VS. SINGLE-WALLED HIVES FOR OUT-DOOR WINTERING.

Dr. Miller's answer to George L. Vinal's question on page 223 has been somewhat of a puzzler to me. I can hardly believe that the doctor would wish to go on record as an advocate of single-walled as against double-walled chaff-packed hives for wintering on summer stands, especially where the thermometer drops to 20 below zero. If I am not mistaken, the experiments at the experiment apiary of Michigan, which the doctor refers to, was not a question of wintering, but only of spring protection of bees that were wintered in the cellar.

My own experience in the use of double-walled chaff-packed hives, covering a period of 17 years, a part of that time where the thermometer frequently dropped to 38 below zero, and remained below zero for weeks at a time, has forced me to the conclusion that, all things considered, they are a little safer than any cellar. I would not attempt to winter bees in single-walled hives on summer stands where the thermometer drops to 20 below zero.

The increased weight, which Dr. M. objects to, is not so serious an objection, after all, as the Dovetailed chaff hive is but little if any heavier than the common ten-frame hive. If I am mistaken in the above conclusions, will the doctor please set me right?

J. E. HAND.

Wakeman, O., Apr. 10.

[Your ideas coincide with mine. The double-walled Dovetailed chaff hive, made of $\frac{3}{8}$ -inch lumber, is but a trifle heavier than the single-walled hive. It costs a trifle more, but this will be more than offset by the better condition in the spring, even if the hives are put indoors for winter. This hive can be put in the cellar, and handled as easily as the single-walled hives; and although it allows two inches of packing all around, it will take up in the cellar only about a third more room. It has been tested for several winters outdoors, with the best of results.—ED.]

HEALTHY BEE-STINGS; HEALTHY MAN.

Early this year you suggested in GLEANINGS a desire for reports in personal experience of bee-stings. I thought of replying soon, but just about that time I had an uncomfortable visit from that throttling fiend the grip, which persuaded me to postpone the contemplated reply. But now that I have apparently overcome the stubborn garrotter I briefly state that my frequent and pungent experiences, both with Italian and German—I can't for the life of me see a particle of difference in their hilarious par-

tiality—I gratefully report that their stings, in my case, are followed by neither excessive pain nor swelling, being little more than the average effort of a healthy Jersey skeeter. But the singular and (to me) delightful experience is that their hypodermic injections afford a sense of rejuvenation—a sort of physical “brace” ensues, which lasts for several days, as from the result of some powerful tonic. The dose being inadvertently repeated at comparatively short intervals—about as often as I attempt to investigate their social relation—keeps me in comparatively high-stepping condition. I long for the warm spring sunshine that will encourage the colonies to bask in full force, hoping that a few well-directed, deeply placed, barbed, heavy-laden propulsions from *Apis mellifica* may restore me to that degree of normal vitality which I feel nothing else can so well accomplish. —EM. DEE.

[When you get stung as many times as some of us, you will long no more for that “normal vitality.” It is possible that they do, in moderate doses, at not too frequent intervals, act as a sort of tonic, aside from the muscular activity that usually takes place immediately after the sting.—ED.]

PLURALITY OF LAYING WORKER CELLS.

Dr. Miller seems anxious to be disputed with regard to a plurality of laying worker-cells. I can accommodate him, as I’ve repeatedly seen that phenomenon among black bees which I attended for a neighbor in Iowa some years ago. I have had but very little trouble with the “varmints” in my own apiary, which has been strongly Italian.

SUGAR HONEY.

[In the *Orange Judd Farmer* of Feb. 15, under the title of “Source of Fats in Butter,” by Henry Stewart, who is surely good authority, I find the following: “When cows were fed on cotton-seed meal, the influence of the cotton-oil in the butter was so pronounced that chemical analysis showed distinctly no difference except in degree between butter so made and the oleo.” The above may contain a suggestion to those who have defended the practice of feeding sugar syrup of any kind to bees with the expectation that it will be “digested” into honey.

SOURD HONEY.

By the way, a former neighbor of mine had a quantity of thin, half-ripened extracted honey, one year, which soured. He kept it over until the next season, and fed it back, saying that “the bees would fix it over some way.” The result, as might be expected, was the spoiling of his next season’s crop, and the ruin, to a great extent, of the market for extracted honey in that section of country.

BURDETTE HASSETT.

Reliance, Va., March 19.

A HONEY THAT WILL NOT CANDY.

Mr. C. F. Hochstein wants to know how to

prevent honey from candying. That does not trouble the bee-keepers of this district, as the tupelo honey we get I have never yet known to candy, and is for that reason largely used among dealers in the North to mix with California white-sage money.

BISULPHIDE OF CARBON; HOW TO PRESERVE COMBS WITH IT.

To those who have empty combs to save from the moth, a very easy way is to put them in empty Dovetail hives, piled one above the other, and made air-tight by pasting strips of paper around the places where they touch, putting an empty hive on the top, then pasting paper over the top of that, having first put inside on top of the frames a vessel containing about a gill of bisulphide of carbon—or, if you have an air-tight room, the same end may be attained by placing more of the bisulphide of carbon near the roof, care being taken, of course, not to go near with a light.

HOW TO LOCATE THE HIVE FROM WHICH A SWARM COMES.

It sometimes happens that a swarm comes out and you are not able to locate the hive from which it came. This may be easily done by taking a handful of bees from the swarm and dusting them with flour, removing them some little distance from the place where the swarm clustered before letting them fly. A few minutes’ watching of the alighting-boards will give the desired information by the incoming of the whitened bees. —E. B. MANN.

Wewahitchka, Fla., April 11.

LOVED AND BEE-LOVED.

By Ellery Krum.

Barlow Skraggs had fifteen stands
Ov fine bees what had five bands
Round thair bodies; and they rolled
In the hunny till he sold
Several thousand pounds. The gold
He invested in a lot
Clost to town, and on the spot
Built the nicest, neatest cot
Ever seen ‘bout there. He got
Sort o’ lonesome like till a
Fair Eugenia crost his way—
Courtred her by telephone.
Fore long she bekum his own
Dear wife; meanwhile yellor bees
Sung love tunes to every breeze
Passin’ by, and chucked each gum
Full ov hunny; then built sum
On the outside, clean around.
One piece purt nigh touched the ground
Underneath the bottom-board;
Never sich a krop wuz stored
Up by bees. Skraggs thought it queer
They should do so well that year—
Guessed he would investigate
Whare thay worked so long and late,
When behold! that telephone,
Over which he won his own
Sweet Eugenia, proved to be
Jist a paradise!—You see
Them bees built their combs up higher
Frum the taffy on the wire!
Alexandria, Ind.



So far as I can gather from reports, bees have wintered unusually well all over the country.

In this issue our Honey Column is based on the Washington grading. All of our honey merchants have been requested to make their quotations according to this grading. It may not be perfect, but it is better than nothing at all. In the meantime, if it shall seem desirable to make some slight changes they can be made if approved by the fraternity at large.

JUDGING by the way the orders are coming in for the Boardman feeder, it is evident that the plan will be thoroughly tried this coming season. I wish our subscribers would take careful notes, and be ready to report after the season, whether such feeding pays in dollars and cents—that is, whether, all things considered, they think their pocketbook is a little fatter after the season than it would have been had they proceeded in the old way. The time of feeding, waste of bee energy, as referred to in another column, amount of surplus honey, etc., must all be figured in.

We print 16 extra pages this time. We have had some articles in type, as you will see by this issue, that were received in October, but which, owing to the crowded condition of our columns, were awaiting a place. Articles are held back, not necessarily because they are less valuable than something else which we publish as soon as received, but because their subject-matter is of such a nature that they can be held over without being out of date or out of season. We are thus enabled to print articles immediately, which, if held over, would be out of date and useless. A few of the former appear in this issue—one from Mr. E. France, one from our old friend and correspondent, Dr. J. W. Porter, and one from Mr. B. Taylor.

A NEW BEE-KEEPERS' UNION.

AT the risk of putting my foot in it I am going to make another suggestion, or, more correctly, "amalgamate" the plans suggested by me before, and those suggested by Bro. York. If the amalgamation of the Bee-keepers' Union with the North American is not wise, then don't do it. Let the North American stand just as it is. Then I would have the Bee-keepers' Union so modified in its constitution and in its plan of operation that it shall have annual meetings, elect officers, discuss problems of protection to bee-keepers, and also those that have come before the North American—in a word, take in *all* the interests that concern the honey business.

It is evident that it is going to make trouble to try to force the amalgamation of the North American and Union. One society will have all it can do to take care of the affairs of one country, without trying to spread itself all over the continent; and a new union or society can just as well do the work formerly done by the two existing organizations.

I should like to hear from our readers, especially members of the Bee-keepers' Union, in an informal way. If it appears to be sanctioned, then the Manager of the Union can take the matter up in proper form, and have it acted upon.

When Mr. Hutchinson proposed the matter of amalgamation of the two societies, and the rest of us fell in with that plan, the idea, as I understood it, was not so much amalgamation as that we did not need two societies. Almost the only objection against amalgamation is the idea of making the Union international. By the plan above proposed, the Union will remain national; and yet the ultimatum that most of us desire to obtain—annual meetings and have one society do all the work that was formerly done by the two—can be accomplished. In the meantime, the old North American can have annual meetings or triennial meetings, as suggested by Bro. York, or disband.

PORTER'S CRITICISM ON GLEANINGS.

As spoken of elsewhere in this issue, there appears a very friendly criticism on GLEANINGS. I intended to add a footnote; but the article was made up before such a note could be put in. Two or three misconceptions occur in the article, which should, perhaps, be corrected. Mr. Porter speaks of the various expenses entailed in getting out a journal, and alludes to a possible loss of \$3000 on unpaid subscriptions. I would not have the impression go abroad that we lose that much annually on deadheads. Our list is practically all paid up, and I do not think we have 100 deadheads—those from whom it is impossible to make any collections—out of our 9000 subscribers. We never force collections, but only politely ask for the subscription money; and if that is not forthcoming, the names are dropped. So far, about 100 a year is about the total number of those who entirely ignore all such requests, and are dropped as deadheads.

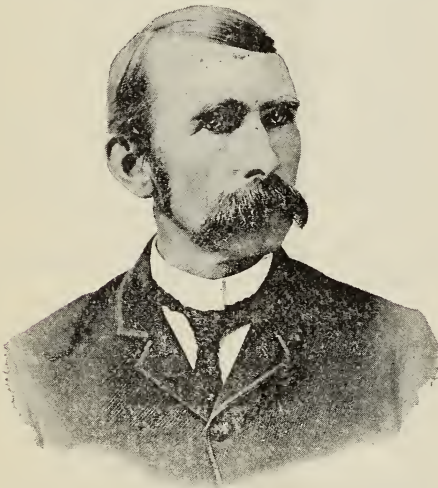
Mr. Porter speaks of defective prints. This may be (and probably was) caused by a single defective impression. Sometimes a printed sheet will not be properly inked; and, again, sheets will go out before sufficient overlays have been made on the press to get the proper impression. What Mr. Porter refers to is something rather accidental, and out of the ordinary, rather than general.

His ideas on designs for the cover of the journal would be, if put upon paper, rather

tame and crude. The scheme of putting a queen or bees, one each, upon the four corners of a bee journal or catalog is an old chestnut. The only real criticism that I think can be made on the design we are now using on our cover is, perhaps, that it is a little overloaded. But this is largely a matter of taste. We have changed the tint of our paper to a light pale blue, as our readers will see, and hence the effect of the design will be much better.

BEE-KEEPER FRED ANDERSON.

SOME time ago, when the Rambler articles were discontinued, I promised that the Rambler would furnish us something new, but did not state definitely what it would be. Believing that Mr. Martin had the talent and mate-



JOHN H. MARTIN, TRAVELER AND AUTHOR. rial for a good bee-keeping story. I requested him to turn his attention in that direction. He at first modestly protested, but said he would try, that after he had written the first few chapters, if he did not throw them in the fire, he would submit them to me. It is sufficient to say that the story was begun and the first chapters placed in my hands.

The plot is laid in California; the hero is a bee-keeper; the writer is the Rambler, and the artist is R. V. Murray, whose inimitable sketches have been admired by all. The story is interesting, thrilling, instructive, and full of droll incidents so characteristic of that Rambler man. Some new phases of California life, especially along the line of bee-keeping, are brought out; and while the story is instructive and interesting, a strong moral tone pervades it.

The first half of the first chapter appears in this number. When our space is a little less crowded we shall put in a whole chapter in each issue; and John H. Martin, the quiet-mannered man, the bee-keeper, traveler, and writer, will be found to be a story-writer of no mean order.

APICULTURAL EXPERIMENTS.

THE Twenty-first Annual Report of the Ontario Agricultural College, located at Guelph, Ontario, Can., has been received. But the part that particularly interests bee-keepers is the report of the apiculturist, Mr. R. F. Holtermann, covering an interesting series of experiments. Not having space to go over this report in detail I shall have to go over most subjects briefly.

FEEDING THE BEES.

A number of colonies were fed sugar syrup, with the Boardman entrance-feeder, and the feed was given a little above blood heat. The results are tabulated, and the experimenter observes that "there is a considerable difference between the first weight of the hive, plus the syrup, and the actual weight six days after the last syrup was stored. The difference in weight may be attributed to evaporation, the consumption of stores which goes on all the time under natural conditions, and the increased consumption likely to go on whenever the bees are under the excitement or stimulus of storing."

The conclusion is thus stated:

(1) That there is a greater difference between the weight of stores supplied to the bees in the feeders, and the increase in the weight of the hive. There is a loss which can not be explained in any satisfactory way.

(2) That it will not pay to extract the honey with a view to making a profit, and supply the bees with sugar syrup for winter.

(3) That, when feeding has to be resorted to, the strong colonies should be given sufficient comb and stores to cover their own wants, and, in addition, supply the weaker colonies with combs of sealed stores.

SEALED COVERS OR UPWARD VENTILATION.

I haven't the space to go into details; but the experiment of wintering two sets of colonies of ten each in clamps showed that the set having sealed covers did not winter nearly as well as those having upward ventilation. This agrees with the reports of two years ago.

COMB FOUNDATION.

Under this heading the experimenter gives some interesting results; and, so far as I know, he proceeds upon methods new and original. I can do no better than to quote nearly all he has to say on this subject:

The use of comb foundation has become general; in fact, few, if any, keeping bees in the movable-frame hive, attempt to do without it. At present, comb honey, owing to the quality of the comb foundation, is not generally of a kind satisfactory to the consumer. Although it is desirable to get a foundation which, when utilized and added to by the bees, gives a comb as thin as the natural one, many claim that comb a trifle heavier is not noticed by consumers. When, however, the base and bottoms of side walls are materially thickened, and the comb has an artificial appearance, and the wax does not crumble when the comb is broken, the result is that the consumer objects, and the objection is intensified by the comparatively harmless nature of the change. Again, comb foundation and wax are wasted in the extra thickness; and this is no small item, as it is generally worth fifty to sixty cents per pound.

In our experiments, observations were taken along various lines—*first*, as to what extent, if any, the bees thin the base and side wall of the various thicknesses and kinds of comb foundation. Measurements were made, whenever possible, of the weight of foundation compared with the number of square feet, and the thickness of the base of found-

dation. Measurements were taken of the comb at the base, the side wall close to the hive, and half an inch up the side wall. The comb was put on ice to harden it for the purpose of more accurate measurement; and three measurements were taken in this case.

Again, to see just how the bees utilized the comb foundation, three tanks of melted wax were prepared. One was colored with a preparation of alkanet, another with a preparation of carbon, and the third was pure beeswax, uncolored. The various stages in the manufacture of comb foundation were carried out, giving comb foundation from each tank ten, twelve, and fifteen feet square to the pound.

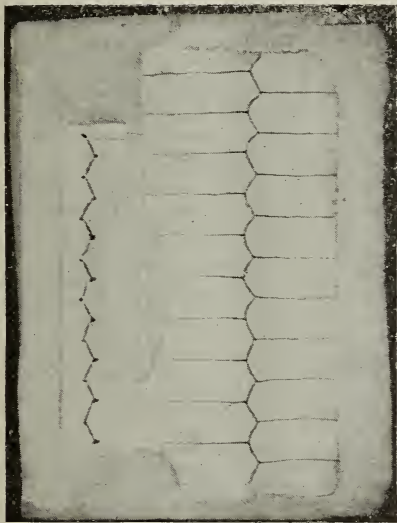


FIG. 1 (c)—giving a side view of comb foundation, 15 sq. ft. per pound; and the same after the comb has been completed and capped by the bees. The honey has been extracted, and washed away from the comb, and a section cut down, which, after a thorough drying, has been filled with plaster of Paris.

These were placed side by side, and drawn out in the upper stories by the bees. It was manifested in various ways that the bees objected to the alkanet, so this kind was discarded. To the foundation, colored black with the preparation of carbon, the bees did not object. The object in placing foundation made of ordinary wax alongside of the colored, was to make measurements of each kind when drawn out by the bees. The measurements of the colored and uncolored, being identical, gave us a basis for the statement that the bees did not object to this preparation; and the method of drawing this out was identical with that of ordinary foundation. The base and lower part of the comb were not, as we might expect, of a black color, and the fresh and added wax white. Instead there is a regular graduation from black at the base to white at the top of the cell. The heavier the foundation, the darker the base and adjoining side wall.

From the above it would appear reasonable to expect that the bees keep adding scales of newly secreted wax and then pulling the side wall, thus decreasing gradually the percentage of colored wax. We also conclude that the quality of wax used in the foundation has an influence, not only on the base, but, to a certain extent, in almost the entire wall of the cell. The heavier the foundation, the greater the influence on the side wall. Again, notes were taken daily when the bees were beginning to draw out the foundation; and although the heavier foundation was scattered about in the various parts of the upper stories, they gave the preference to the heavier foundation, working on it first. Great caution must, of course, be observed in coming to conclusions. The bees, if the heavier foundation had been taken away, might have been almost as willing to go to work at once upon the lighter grade. At present no way appears open for conducting a satisfactory experiment to prove any thing in this direction. The measurements taken at the base of the wall, and half an inch from the base, all tend to

show that the wall is thicker at the base, and tapers, becoming thinner at the mouth. So far as I am aware, no one has ever made such measurements.

The "Vandeusen" is a flat-bottom (unnatural) foundation. The various specimens of this kind which were put into the sections were partially covered to prevent the bees from touching the covered portion. The remainder was left to the bees. In every case the bees changed the base from flat-bottom to natural. I have adopted a new method.

EXPERIMENTS WITH FIVE-BANDED ITALIAN BEES.

This is summed up in the following deductions:

- 1st. They are below the average as to wintering qualities.
- 2d. They are short-lived, probably because of a high-strung temperament.
- 3d. They are prolific.
- 4th. They are gentle, unless when queenless.
- 5th. They are inclined to rob.

In conclusion, I may say that the Ontario Agricultural and Experimental Union also conducted co-operative experiments with these bees. Nine successful experiments were made, and, with the exception of one experiment, the above results were indorsed.

There are three other engravings similar to the one above, which I will give in our next, but which for want of room we omit in this issue.

DEATH OF MRS. A. J. COOK.

WE have for some time been aware that the wife of our good friend Prof. A. J. Cook was not long destined for this world. It has been my good fortune to be rather intimately acquainted with the professor's beautiful family for quite a good many years, and I have always regarded Mrs. Cook as one of God's own gentlewomen. I have seen her amid trying seasons. I have been with her and her good husband and their two children, at home and abroad. You know it was my good pleasure to be with them a part of the time on that trip to California; and from first to last I have always been impressed with the fact that Mrs. Cook was one of the world's ministering angels whom we perhaps never fully appreciate until God has called them away. The following, from our bereaved friend, was perhaps not intended for publication; but I feel so sure all of the friends will be so glad to see it I take the liberty of giving it entire.—A.I.R.]

Dear Mr. Root:—The beloved wife left us last Thursday, the 16th. The last few hours were full of suffering and agony, and so we rejoiced in the release. You knew her beautiful spirit, and can feel for us with this burden of sorrow resting upon us. I never knew one more true and sincere, or more thoughtful for others' comfort. Her favorite text in her long days of sickness, with no promise of recovery, was: "Be still, and know that I am God." She was serenely quiet, and never made even a whispered complaint; and God was very good to her. So, while we could not pass the river with her, she was not alone. Her memory will be an inspiration to us in all the coming years. To see such a leave-taking makes immortality sure. We were all here. Burt is about well again, and goes east about May 1st. Sorrowfully but truly,

Claremont, Cal., April 20.

A. J. COOK.



Take care of him; and whatsoever thou spendest more, when I come again I will repay thee.—LUKE 10:35.

Professors of religion are often criticised because they do not make a more practical use of what they profess. Our enemies say we talk beautifully in the prayer-meeting; but when it comes to putting these very ideas into practice in every-day life we forget all about it. Well, there may be some truth in this. The religion of Christ Jesus goes against the grain. It is not natural to us. We are human, and Christ's teachings are divine.

There is one class of neighbors that we have had considerable to do with lately. In fact, I suppose most of you see more or less of them. I allude to the tramp element. Come to think of it, I do not know that they *are* neighbors after all. Some of them would be neighborly, and once in a while we are forced to the conclusion that they *are* our neighbors, although a good deal of the time it is a hard matter to decide just what true Christianity would say we ought to do in regard to them. Perhaps I have told you before that we have an arrangement here at the factory to feed everybody who is willing to work for his daily bread. No matter who comes, nor how many come at once, if they are willing to work an hour in the lumber-yard, or in unloading coal, we furnish them, for such services, a meal of victuals—all they want to eat. This is so well understood that the neighbors far and near tell these people to go right over to Root's factory, and the women-folks there will get him up a good substantial meal, providing he first works one hour.

Do you say this is generous? Well, it might be if the tramps would avail themselves of the privilege. But they do not regard it as a privilege. A month ago I was thinking of making the statement public that not one in a hundred of these fellows would work for a living, even if he had a chance. Sometimes they get mad if you suggest it. One fellow said to Mrs. Root, in an insolent way, "I wonder if you think I am going to shovel coal for an hour just for something to eat." And he straightened back on his dignity, and went off offended. A great many times they ask what *kind* of work. When she tells them it will probably be shoveling coal they invariably go away in some other direction. Perhaps I should say *almost* invariably. During the severe weather in the month of March, however, something happened, I do not know just what, so that quite a few consented to work. Oh! by the way, some of you may suggest that it is hard-hearted and cruel to require a hungry man to shovel coal for an hour when he may not have had sufficient food for perhaps a whole day. Well, it is hard; but every time I have tried feeding these fellows first, and letting them work afterward, I have been swindled—at least, *almost* every time. They make some pretext or excuse like this: One fellow talked so very honest and fair that I gave him his meal first. After he had been fed, instead of being thankful he seemed to be very much inclined to be overbearing. I told him to go and assist some men off in a certain direction. After he had asked them all around for a "chaw of tobacco," and they had told him they did not use it, and that Mr. Root did not like any of his men to use it, he went away with an oath, declaring that they wouldn't catch him working even an hour for any man so "narrow-minded."

Well, along in March, as I was telling you, there was a carload of paper to be run on the trucks into the press-room. Our men were all busy, and three strangers were permitted to do the job. They worked so well that we gave them their meals for several days for doing jobs of this kind. They were a better-looking set of fellows than the average tramp, and better behaved. They took hold with such energy and muscular vigor that my heart warmed toward them. Finally some more came along; and as work was pressing we decided to give them a trial. We had just finished our dinner, and it would be less trouble for the women-folks to feed the whole of them than to get up a meal an hour later; besides, Jacob said his work was not quite ready. They all declared they would work all right if they had their dinner first. I looked into their faces, and told them what bad luck I had had, and every one of them seemed like men who would not be guilty of swindling the man who had befriended them. After they had washed their faces and brushed their hair they looked quite respectable. I was in a big hurry, opened the door of the dining-room, and told them to go in. Pretty soon Mrs. S. reminded me that there were *seven* men waiting for their meals, instead of *four*. Three more than I had noticed had taken advantage of the fact that I had so many to direct all at once, and slipped in unobserved. It seemed too bad to make them get up from the table and go away; besides, I could not tell which were the original ones whom I had bargained with and who were the others. I asked them again if they would all seven work for us a good honest hour. They said they would. I left them, and forgot all about the matter. During the afternoon, however, there seemed to be a good deal of merriment in regard to my gang of tramps. When I asked for an explanation, the foreman of the lumber-yard said that, about fifteen minutes after they commenced work, a slow-moving freight train passed by, and five of the seven, with a sort of Indian war-whoop, left their work, ran and jumped on the moving train, and that was the last of them. I was not very much surprised. I have had the same experience so often that I blamed myself for being humbugged once more. A few days ago I said to my brother-in-law, who is a railroad man:

"Look here, Mr. Holmes, are you in the habit of carrying tramps from one town to another all over the country, free of charge, without so much as even a thank you?"

"Yes, that is just exactly what we and every other railroad in the United States are doing."

"Well, but why do you do it? Isn't there any way to put a stop to such lawless, reckless vandalism?"

"I don't know any way. If you do, I wish you would tell us how. If they jump on to the passenger trains in this way the conductors and porters can put them off; but how is the conductor on a freight train to keep men from jumping on if they want to? He has not time to stop and quarrel with tramps, especially where they are two to one. It is not the engineer's business, and the brakemen have already been hurt without doing any particular good, as you may know if you read the papers.* These fellows laugh in your face when you talk

*Only last summer a contractor, who visited Medina and made a bid on paving our streets, was killed on his way home, and it was supposed to be the work of a lot of tramps. In order to reach his home that night he took passage on a freight train. A lot of tramps climbed on and occupied the same car, and during the night they overpowered him, took his money, and threw him off the train. So far as I know, they have never been apprehended.

about law. Putting them in jail does not do any good, for that is just what suits them best, especially in the winter time when it is too cold to be outdoors. I agree with you that it is a shame and a disgrace to our country; but what are you going to do about it?"

Just then it occurred to me that I had seen notices in the papers, of tramps being maimed or killed while stealing rides on the trains; and nobody seems to care whether they are killed or not, and I don't know that they care very much themselves either. All manliness, pride, intelligence, or interest in any thing except to satisfy their animal wants, seems to have been lost, or at least mostly obliterated.

A few days ago a messenger boy at our station, a bright little chap who carries telegrams and other messages all over town on his wheel, came to me saying there was a tramp over at the depot, with a broken leg, and that nobody would take care of him or seemed to care any thing about it.

"Why, go and inform the infirmary director, and he will certainly see that the tramp has proper attention."

"Well, that is just what I have done, Mr. Root; but he says he does not belong in our town nor in our county, and he can not do any thing for him without consulting the board of directors. He has been there already since seven o'clock this morning."

"Was his leg broken by climbing on the train?" I asked.

I was busy that morning, and had not time to think of tramps or of anybody else, and I do not know but I opened my lips to say something like this:

"If he got his leg broken by jumping on the cars, contrary to law, it served him right."

I guess it must have been Satan who whispered to me to add, "Let him lie there until he gets enough of it; he is just meeting his own deserts. It is good enough for him, and it is no affair of mine, anyway."

By this time I began to be startled. I was thoroughly disgusted with Satan, and mentally bade him shut up. I do not know but I felt like adding, "Get thee behind me, Satan." And then perhaps it was to let Satan see that I was not that sort of man *at all*, I turned to "Toney," and said:

"Toney, you get some help; have that man taken over to the hotel; get a doctor, and fix up his leg, and tell them all to bring the bill, and I will pay it."

Then I started to do several things that ought to have been done while I was talking there. To tell the truth, I was a little surprised when a pleasant feeling came over me, and I did not know just why it came, either. Then somebody seemed to whisper the words at the head of my talk to-day, and I was almost startled to think that I had unconsciously used almost the language of the good Samaritan: "Take care of him; and whatsoever thou spendest more, when I come again I will repay thee." I did not have any thing to pay, after all. Toney did as I told him; but by the time the doctor got around, the infirmary director had probably come to about the same conclusion that I had. So they fixed up the tramp and sent him to a hospital in Cleveland.

In conclusion let me say that it is, without question or word of debate, our duty, of course, to take care of an enemy, a tramp, an escaped criminal, or a *highwayman*, who is wounded and helpless, no matter how he got into such a plight. When the matter was brought up at our Saturday prayer-meeting, one good brother said something like this:

"Brothers and sisters, it certainly is high

time that this lawless element in our land were looked after; but I think Mr. Root is right when he says that those who will not work shall not eat; and I am really afraid it is the good people of our land—may be the Christian people—who are *paying a premium* on this sort of tramp life by feeding indiscriminately everybody who comes along. These fellows often boast that they can get a living, without work. They have learned the knack of getting on and off from moving trains. The railroad companies are helpless, therefore the tramps roam from one end of the land to the other, having a good time, and we Christian people support and encourage them in it. They toil not, neither do they spin; but hard-working people feed them. Is it any wonder that this class is increasing to an enormous extent?"

Last Thanksgiving day, just as we were sitting down to our dinner over at Mr. Calvert's a man came to the door for something to eat. My daughter, Mrs. Calvert, in order to get rid of him without worrying me to hunt up work for him on that day, when the factory was shut down, gave him a nice slice of turkey, and some bread and potatoes—in fact, quite a comfortable Thanksgiving dinner. As he passed by the window where we were sitting at our meal, he raised his hat and thanked us very graciously. Now this fellow was tolerably well dressed. The hat he raised was almost brand-new; in fact, he was better dressed than A. I. Root is most of the time. But he had discovered that he could get a good meal of victuals without paying a cent for it, if he met the right sort of people and practiced the arts he had learned in the way of getting into people's good graces. Giving him a dinner was a trifling thing, you say. But is it not true that trifling things like this may be the cause of inducing thousands of able-bodied men to throw up work and take up a tramp life?



SUB-IRRIGATION.

The bed described on page 29, Jan. 1, is now, during the middle of April, giving us some of the finest strawberries I ever raised anywhere. The foliage is beautiful, bright, and clean. Under the influence of plenty of water, protection from severe weather by means of glass, and steam underneath the bed to give the requisite heat, we have complete success; and during the past ten days of almost July weather in the month of April, with scarcely a drop of rain, the sub-irrigating beds have been working to perfection. By the way, in our correspondence, a friend, Mr. E. W. Turner, of Newton Falls, O., sends us a little home-made wood-cut showing how he applies sub-irrigation to growing vegetable-plants, etc. We give the cut and his description.



A NEW WAY TO GROW CELERY—BY SUB-IRRIGATION.

You will see by the above cut its application in celery or cauliflower growing, where moisture is the essential factor. Its cost is nominal compared with the results you will gain by its use.

The appliances necessary are a common $\frac{1}{2}$ -inch black gas-pipe. Bend up one end 8 inches; screw on

a paint-keg or bucket—any thing that will hold water; drill or punch $\frac{3}{8}$ -inch holes 8 inches apart on the upper side; plug up hole in lower end of pipe; place the pipe in the trench; cover over with moss or woods soil to the depth of 2 inches. This will hold moisture; put on 2 inches of very rich soil; set your plants 6 inches apart over the pipe; pour water into the tank when you wish to water plants.

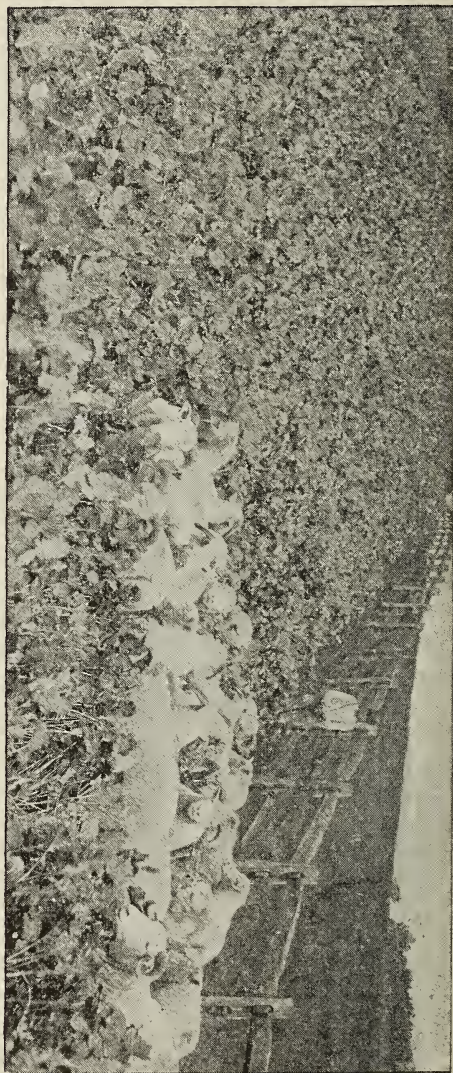
Newton Falls, O.

E. W. TURNER.

This arrangement makes the whole matter exceedingly plain. On a larger scale we use the cheaper small-sized tiles instead of the iron pipe; and the joints between the tiles (closed with cement except on top) take the place of the holes. By the way, the idea of covering the openings for water with moss is a very important matter. With clay soils the openings are liable to be stopped, and thus give unequal watering. The question keeps coming up. If this matter is such a wonderful success under glass, why not apply it to open-air work? I have before explained the difficulties in so doing; but just now I hear of one case where the thing has been made a success. A man in our own county has a swamp which he reclaimed by tile-draining. The entire outlet to the swamp is through one large main tile. Well, during a dry time he shuts up this one opening, and lets the water back up in the swamp as it did before there was any outlet. This accomplishes the whole thing to perfection. You see, the swamp was originally a depression with an impervious soil under and around it, so that it holds water. Thus, you see, nature has obviated the necessity of a water-tight bed of cement, boards, etc. When heavy rains come suddenly, the outlet is opened wide; and this permits the water to get away before it can do any damage to the crop. Of course, somebody must be on hand to manipulate the gate that holds the water in or lets it out, or trouble would result. There are many such swamps as this, and it seems to me it is high time they should be utilized for sub-irrigation. Mr. W. S. Turner, now in my employ, and who formerly assisted in developing sub-irrigation in greenhouses at the Ohio Experiment Station, at Columbus, has told me in regard to this reclaimed swamp, and I propose visiting it soon. The owner arranged the plant under Mr. Turner's instructions. It was a complete success last season in producing enormous crops during our severe drouth. As spring near by furnishes the water to fill it up during dry seasons. During hot sultry weather, accompanied by hot drying winds, such as we have had for nearly two weeks, sub-irrigation seems to be almost the only kind of irrigation that succeeds perfectly. Surface watering is just a vexation. In fact, some of our lettuce-beds would suffer for water, even if we left the hose running almost constantly; that is, the water would get away through the cracks in the dry soil, scarcely wetting up the bed at all. What we need is some sort of tight box or reservoir that will hold the water so that not a drop be wasted. This being secured, even a small stream will in time fill up the bed and raise the water level, just as near the surface as we want it; and it does not take very many inches of soil, if well enriched, to produce a crop. Those enormous strawberries, with leaves as big as your hand, and berries almost like hens' eggs, have not more than 6 inches of soil to grow in; and there is a plant on every square foot of surface, right over the bed. They are now not only producing lots of large perfect berries, but are sending out thrifty runners at the same time. At this season of the year we get forty cents a quart for the fruit, which I think will pay well for the glass, sub-irrigation, and steam heat, where exhaust steam may be utilized.

ILLUSTRATING SEED CATALOGS WITH PHOTOGRAPHS FROM REAL LIFE; DWARF ESSEX RAPE; A PICTURE OF IT; SOME FURTHER PARTICULARS.

I have before made mention of the beautiful photographs from real life, to be found in Johnson & Stokes' (Philadelphia) seed catalog. They have kindly loaned me one of the plates illustrating a flock of sheep in a field of Dwarf Essex rape.



The above picture took my eye at once; in fact, I would give something to see some sheep turned into a patch of this new forage-plant, just as it is in the picture. Then I would give something, too, to see them after they had learned to eat it. We extract the following from the catalog of Johnson & Stokes:

Dwarf Essex rape is considered indispensable by the sheep and cattle farmers of Great Britain, and is fast coming into use in this country on account of its rapid growth, being ready to feed in ten weeks from sowing, and producing 25 to 30 tons of

green forage to the acre. It grows to a height of 3 feet, and covers the surface so densely as to smother out all weeds, and to kill quack and other objectionable grasses. It can be sown all through the season; being perfectly hardy it withstands drouth, and will produce a crop in any soil by sowing broadcast at the rate of 5 lbs. to the acre, or in drills or rows 2 feet apart at the rate of 3 lbs. per acre. While unequaled as a pasture for sheep, as a fattening food for all kinds of live stock it is without a rival in point of cheapness or effectiveness.

In addition to it we may mention that it has been tried to a considerable extent here in Northern Ohio. The last season a very severe drouth was rather unfavorable; but for all that, it gave a very large amount of feed, and held out clear into the winter. One man has even put in ten acres, and we had quite a good many orders for the seed, even before we had advertised it. The great secret of its value lies in the fact that it is a relative of the winter kales. You know we sometimes see them in the gardens with their rich dark-green and purplish-green that last clear into the month of February, and sometimes *all winter*. Our Ohio Experiment Station has several times called attention to its value. In answer to some inquiries to Prof. W. J. Green in regard to its blossoms for honey and raising seed he replies: "The Dwarf Essex has never bloomed the same sea-on it was planted, here. We think it requires two seasons, the same as cabbage. We do not know any thing of the value of its bloom for bees." Now, can some of our readers tell us any thing about its value for honey? Where is the seed raised? We judge it is not far away, since it is offered now at quite a low price.

The following is also from the Ohio Experiment Station:

Regarding the Dwarf Essex rape, I have to say that, if sown early in the season, say previous to the middle of June, I believe it is better to plant in drills about 30 inches apart, and cultivate, surface cultivation. In this case two pounds of seed per acre may be used. If sowing or planting after the middle of June on ground on which the weeds were pretty well cleaned out, it will do as well, if not better, sown broadcast, using five pounds per acre. You will find that, seeding later, the plant will grow almost twice as fast as if sown as early as the first or the middle of May. I have grown this plant for three years on the Station farm; have planted early and late, but have not yet had a single plant to blossom the first year. You will find it very similar to the cabbage-plant, and will have to contend with the same enemy, the cabbage aphid. Three years ago our entire crop was destroyed by these insects in a very short time.

I should have said above, that one seed every three to four inches in the row will, if good, make it thick enough, and that the plant will require just enough attention to keep the weeds out, and an earth mulch. The plant will cover the ground much more quickly than the corn-plant, and will, therefore, have a shorter working season.

Wooster, O., April 13.

J. F. HICKMAN.

A HOME-MADE WHEEL-HOE; HOW TO MAKE IT AND HOW TO USE IT AFTER IT IS MADE.

Friend Root:—While your brow is still contracted on account of this intrusion, I will try to soften the lines by adding that this letter is not written for any personal gain; and, no matter whether it is of any use to you or not, the intention of the writer is, nevertheless, honest. Cavil not that I say that I understand your motives in life; I do know that the aim of your whole life is to do the world all the good you can; and now I have set about it to make some return for the benefits you have been casting upon the water, and part of which have come to me.

I hand you herewith a home-made weeder, the plan of which was born of necessity. Having diligently tried the several hand-weeders sent out on the market by seed growers I found them all lacking. After two years of trial I went at it, and in a few hours made the one which is shown in the accompanying drawings.

I am of the opinion that, if you have any muck or sandy soil, this little weeder will be just the thing that you have been looking for. I say it will, carefully speaking, do the work of five men behind five hoes. Of course, in making this estimate I suppose that you are nearly as particular as I am about the condition of your ground for gardening. Perhaps you are just as particular. I never allow a plow to be put into my garden unless I am present to watch the work; for when the plowing is done I want to see nothing on the ground but the black dirt. One single straw or stubble on the surface makes me tired; and when all is planted it must be beaten and rolled till it resembles a well-used road after a nice shower. Then with a hand-harrow made by driving 10-penny nails through an inch board, the board to be of a shape and size to suit the fancy, work of pulverizing and weed killing goes on day after day till the drilled plants sufficiently show themselves to permit of following the row with the weeder. True, I find no one to run the wheel to suit me as well as I do it myself; but if pressed for time others use it. You see the little harrow does the same work as the vibrating harrow which you wrote of in your last issue.

I suppose you will want to know how large the garden is: so I reply that I have just an acre, less the house and a little plat of grass surrounding it. It is almost flat, but possibly the east end is 3 or 4 inches lower than the other side. I will reply to your next question, it will take 8 hours to weed the garden (one acre) with the hand-weeder—onions, beets, peas, potatoes, and corn—every thing. These with me are all in drills, absolutely straight.

What I now say you will dispute. This garden is on ground that has been planted constantly to corn and wheat for 27 years without any fertilizing. Of course I am attending to that now; yet the first crop was a good one notwithstanding that strain.

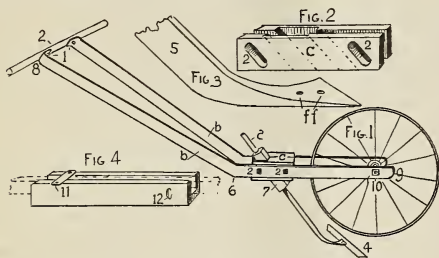
I have so much faith in this plow that I want you to make one and try it yourself. When you have done so you will be pleased with it. Then I wish you would make them for those who can not make them. Remember that the point, or one of the things to keep in mind, is the thinness of the blade, as well as to keep it just as narrow as you can and have it stiff enough not to give bother by bending. It should be quite flexible. Mine is made of the blade of a corn-knife. For most work I set mine so that, when it works, it runs about half an inch under, running so smooth that the ground over the blade is scarcely disturbed. I first thought that I must set it so that it would "rattle" the soil; but I soon found that this was not necessary, as, in sunny weather, all weeds are killed when once gone over. When I see the ground over the blade begin to hump up, that is the sign that it is not cleaning, and I at once relieve it. It will have to be cleaned as often as a hoe does in the same soil and weather. You will see at once that the plow is very light, and easily turned down side up to clean, or to go into the field with. Probably it weighs 5 or 6 pounds. When running close, say to a row of onions, of course you slow your gait; and I generally venture within $\frac{1}{4}$ inch of the plants.

Now, do try to be consistent and charitable; for you know that, as a rule, people of the East have no great faith in the ability of Westerners. Please do not say that you have tried the same thing made by Ferry, for I tell you the blades set upon their plows are not practical, and are too expensive; and it takes, I believe, four times as much strength to push them. The work of running this plow is no harder than that of drawing ten pounds on a boy's small wagon.

These remarks all apply to "flat" culture; and to me it seems very strange that, in our whole town, I am the only one who follows flat cultivation. Years and years I have neighbors near on all sides who spend as much time on one lot as I do on six. They often harvest the crop with a scythe when it gets too unsightly; and with all the proof that I can offer, with all comparison that I show them, every year they start out with little beds and little short rows, and keep tearing up the ground to let it dry and bake as deep as they stir it; and on this kind of ground they borrow my plow to use among lumps and bumps and old cornstalks and other debris. How is it? Is it because you are such an orator that people tumble to what you say? Why, some people will get mad if I speak of flat culture. But my plow is good only for flat culture. Well, try it. It costs you nothing. I should like to make some one as happy as I am when I use this little weeder.

EXPLANATION OF DIAGRAM.

Showing a home-made plow that has been used by the writer for ten years; entirely practical to those who believe in flat culture and love a clean, well-kept garden. This weeder is designated by the family as the "Prairie Grasshopper." On well-prepared soil, with this weeder one man can easily do the work of seven men with a hoe. In corn and potatoes and other large plants it will cut a swath 12 inches wide as fast as one can walk or run. Having an unused boy's wagon-wheel (iron) the outlay for material was 65 cts.; work done by writer.



PORTER'S HOME-MADE WHEEL-HOE, OR CULTIVATOR.

The parts b b are made of heavy band or wagon-tire iron, 1x $\frac{3}{4}$ inch. Before bending, each piece should be about 4 ft. long, 2 inches being allowed for making a turn a little more than at right angle at the top where it is fastened to the handle-bar, 1, by a timber-screw. When fastened to the handle-bars, the side pieces b b should be 12 inches apart, and the ends of b b turned in instead of outward. A four-inch hand-hold is left on each side of bars b b. From handle, 2, to Fig. 6 (bend) it should measure 2 ft. 3 $\frac{1}{2}$ inches; from 6 to 9, 13 $\frac{1}{2}$ inches; between bolt-holes, 2 $\frac{1}{2}$, 4 $\frac{1}{2}$ inches. From a line drawn from 9 on to 6 (bend), and extended on as far as handle-bar, from bottom of bar down to such line should measure 15 inches. The wooden block c is made in two pieces; or, rather, after having been made it is sawed in two to admit of pressure on grooved post 7, when nuts on bolts 2 2 are tightened. Bolt-slots in c are elongated for the purpose of adjusting the cutter-blade 4. Block c is 6 inches in length, 2 in depth, and 3 inches wide, or should be about the same width as the length of the hub on the wheel; made of pine or basswood. No. 7 is of hard wood, 1 $\frac{1}{2}$ x1 $\frac{1}{2}$ inches, and 8 or 10 inches long. The groove in 7 should be just large enough to admit of blade-bar 5 fitting snug, yet admit of its being moved up or down; and, when just right to do the required work, is fastened in place by set-screw 12, which should be on the lower end, and the groove facing the wheel, as shown more clearly by the shadow of bar 5, placed in position on No. 4. Blade-bar No. 5 is about 1x $\frac{3}{4}$ inch, pains being taken to so bend it that, when riveted to blade at f f, the lower side shall be parallel with the plane of the blade for 2 or 3 inches back; and the edge of the end where it unites with the blade is brought down to a feather edge, and should be about 6 inches long from the bend to top. The blade may be of any length; but a 12-inch blade suits me best. It shouldn't be over an inch in width, or 1x $\frac{1}{4}$, and just as high tempered as possible, and yet permit it to be sharpened with a file; and the thinner the better till a point is reached where it would be too limber. Set to post so that it will slant, say, one end about 3 inches in advance of the other, entering ground close under wheel.

Ponca, Neb.

J. W. PORTER.

THE GAULT RASPBERRY.

The plant I got from you last spring has done nicely. It made some 12 sets. Do they run on the ground? Some of the sprouts grew 5 or 6 feet long. Do they have to have a trellis to run on?

My bees are doing nicely. I lost none last winter. Towanda, Ill., April 14.

S. C. WARE.

No, they do not exactly need a trellis—that is, if they are cut back sufficiently; but where you let them run in order to get tips, the fruit is very apt to be down in the dirt unless you tie to a wire or something similar. We have plenty of reports from those who have succeed-

ed in getting plants from the Gault raspberry; but why does not somebody tell us about the amount of fruit they get? Surely the berry has been before the world long enough so that some one should have a lot of great clusters of nice berries as well as friend Gault and myself. How is it? Does not the plant bear berries "at your house"?

IS IT THE WORK OF THE BEES?—SEE PAGE 132.

A few years ago I bought a package of Henderson's bush lima beans, for which I paid 15c for a package containing 5 beans. I planted them three years before I had enough to use from them. The third year I planted near them a few beans called W. Zula. These were a purplish color, and a runner. When picking a few shell beans from the Henderson's bush lima, to my astonishment some of them were speckled. I picked out all that were marked, and destroyed them. I planted the fourth year none but what were clear white. Last year I noticed they put out a good many runners; and on harvesting them I was astonished to find them all like the sample I send you.

The only colored beans I have raised in the garden are the W. Zula, and the last year a few early Valentine. Is not this the work of the bees?

Clintonville, Wis.

DANIEL NOBLE.

The sample beans mailed of the above were speckled Henderson bush lima. Some of them were mottled, with reddish streaks splashed with black. It is either fertilization by the bees or else a sport. I am inclined to think the former, for we have raised Henderson's bush lima, 30 or 40 bushels in a single season, and have never seen a streaked or speckled one.

Health Notes.

WHOLESALE BREAD, AND OTHER MATTERS IN REGARD TO DIET, ETC. FROM OUR OLD FRIEND MRS. L. C. AXTELL.

Dear Mr. Root:—The way I make rusk is to make my whole-wheat flour into bread after what is called potato-ball bread. I gave a description how to make it some two or three years ago. I have tried many ways to make good graham bread, but none gave so good results, nor are so easily made, as the potato-ball bread. The yeast is wholly of potato, and does not sour so easily as other yeast or bread. It rises more quickly, and keeps moist longer, in bread; but all bread made of whole-wheat flour is better the first two days after being made. After that I slice it down and crumble it up fine with my hands, which is easily and quickly done, then pour it into bread baking-pans and set it in the oven to dry, being careful not to brown it much. If browned it gives it a more constipating nature.

When thoroughly dry we put it in a dish, and either eat it dry or slightly moistened with thin cream or new milk for supper. We think it better for us eaten dry, because it causes the saliva to flow and moisten it, which aids digestion. If it is to be cooked or softened before being eaten, then there is no need of crumbling it, as a few minutes of soaking the hard crusts after drying will render them perfectly soft. We like to have the bread crumbled before drying, because it is much easier done than grinding afterward; and if not broken small before being put into the mouth it is apt to injure our gums, whether we have false teeth or not; but if fine, the saliva softens it almost immediately. I have been troubled by indigestion for years, and find it the most easily digested of any food I have ever tried, especially for supper.

MASHED APPLE.

Another equally valuable food is mellow apples pared, sliced, and squeezed to a pulp by the hands. Add a pinch of salt and a little sugar. The squeezing or jamming (not chopping) should be done just before each meal, as they turn dark so soon. Mr. Axtell and I are very fond of them, and find them better for our diet than if cooked or eaten raw between meals. Mashed apples and the dried crumbled bread go well together. The greatest trouble about eating the mashed apple is that it tastes so good one can hardly help eating too much of it, es-